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Science and public policy

John Maddox

Editor, *Nature*

Paper presented as the 13th Aslib Annual Lecture at the Royal Aeronautical Society, London, 11 June, 1980

I WOULD LIKE to say how glad I am to be here this evening. I should begin, actually, by saying how the title evolved because you will recognize, all of you, that it is ambiguous. It began because the Director of Aslib said he would like me to talk about the way in which scientific information could be organized more effectively so as to help the government and other public authorities make better and perhaps wiser decisions. I had no objection but on reflection, I wondered whether it is possible to be as specific as that about a matter as broad as the way in which governments make public policy. And so I finished up with this title, which has at least three meanings which I'll list for you. First of all science and public policy may mean 'How does the government behave towards science?' Is the government doing the right things in its care and custody of the scientific community? Is it providing enough money? Is it looking after the universities well? Is it doing every other kind of thing which scientists would like to see the government do? Although this isn't the part of my title consistent with that which the Director first suggested, let me make a few brief remarks to which I'll return at the end.

I believe that in this country the scientific community we've got now is in much greater trouble than it's ever been since the Second World War. It is probably now the case that Britain can boast more second rate research than has ever been done before. British scientists, and particularly British academic scientists, are more dispirited, more lacking in hope for the future and indeed more seriously under threat for the quality of their work than has in recent memory been the case. I think that is a national problem. It does seem to me that it raises all kinds of questions about the educational system, about how the universities should be organized, how the scientific community itself should conduct its affairs but as I say, apart from a few words at the end, I don't want to go into that intriguing can of worms. I want instead to talk about a few other aspects of the general question of science and public policy.

First of all how can members of professional organizations like Aslib, members of the scientific community and outsiders—mere journalists like me—do something or other to help improve the quality of public policy where it bears upon scientific matters? And, of course, linked with this, is the question of how the government might more effectively arrange things so that the community at large can enjoy more of the benefits of science and technology. I want to deal in I hope not too solemn a way with these last two questions. Let me say first of all that when I use the word science, I intend it to mean science and technology, but it excludes social science, economics and so on. It's as well to get this straight because people can argue that

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the essential benefits of social science are in the conduct of public policy and are as great as those in science and technology. This happens, incidentally, to be a view that I don't share, but I acknowledge the force of the argument.

Let me make one other general point; a point really about the nature of the scientific community and a point about why a great many people become scientists. I do think it is true that when kids of 10 or 15 or 20 are wondering what careers to pursue, a great many of them say 'I will become a scientist because it seems to me that is the way in which it will be possible to enhance the quality of ordinary people's lives, improve the quality of public service, help in some way or other to make the whole community a better and a wiser place.' We middle-aged people may say: 'How naive of them'. Yet many of us will recognize that that kind of thinking was present in our own inexplicit view of how we might make careers for ourselves. And I do think that the reason why a great many of us are frustrated now at what appears to be the poverty of government policy in relation to science is that we feel that our altruism, our sense that somehow science and technology might help to improve the world have been in one way or another disappointed.

I cannot, in dealing with the two aspects of my theme that I've picked up so far, deal adequately with the question How can the store of information be dealt with more effectively, how can this be so organized that government policy will be better? I know that you in your ways as professional librarians and information scientists are concerned with these problems. I do appreciate that in the past 20 years there has been an enormous increase of the efficiency with which people of all kinds can get hold of the information of which you are the custodians. I would not presume to enter into that field at all.

Let me therefore stay with general items and make this assertion: I said just now that a great many people in the scientific community might justly say that there has been a massive neglect of science in the past few years. I think it also fair that we should acknowledge that in the past 100 or 200 years there has been a remarkable transformation of the quality of our society brought about by the application of science and technology and I don't just mean innovations of the kind that made the Industrial Revolution possible in the early 19th century, undeniable though their value is. I also refer to the way in which discoveries in academic science have improved the temper of society; the way in which Darwinism, the theory of evolution, has helped ordinary people assess their place in nature more accurately than ever before. Our present understanding of what the universe may be like has in the same way helped people to a better perspective of where the future may lie. It's helped them in a way to appreciate more accurately what's going on in the world about them.

So science has done a tremendous amount to satisfy the idealism of young people entering the profession. But this community—all communities—should be more interesting and better places in which to live. All of us can compile our own lists of which things we'd like to see handled differently, and I offer you mine simply as an illustration of the kinds of problems that I think in due course have to be tackled. In this connexion, I think it is also important to recognize, and to be explicit in recognizing, that however much we may hope that science and technology can improve the world, we have to recognize that—as the mathematicians say—science and technology is a necessary but not sufficient, emphatically not a sufficient condition, for the improvement of society.

Let me give you a simple illustration. It used to be that felons, because they stole sheep, or stole anything, were in danger of being hanged for their crimes. In recent decades, we have come to recognize that a great deal of delinquency is not really the consequence of some inherent quality called criminality in the people called felons, but rather may be a consequence of how people are brought up. It may be a consequence of this or that factor of environment, may even be in some cases a consequence of poverty. We have also given up the practice of hanging felons. But if you think of it, that we have given up the practice of hanging felons doesn't follow automatically from the discovery of the nature of delinquency. It would be entirely possible for a government to say: Whatever the causes of delinquency in our society, if a person is convicted, it's plainly a great benefit to society—it reduces the cost of keeping him in gaol—that he should be hanged. Every age nevertheless abandoned the practice of hanging not on the grounds that are suggested by discoveries in social science about the nature of delinquency but for quite different reasons, because in one way or another, society feels this to be the moral and just way to go about the punishment of criminality. We put people in gaol; we do not hang them. The social science is necessary to the improvement of society's way of dealing with felons but it is not in itself sufficient.

My list of frustrations is a personal list. It is extraordinary that after a quarter of a century of concern about the dangers of nuclear war and after a quarter of a century of really rather good academic work on the problem of arms control and the problems of how arms control might be more effective, so little has been achieved. People have promised not to put nuclear weapons on the floor of the sea, people have promised not to put military forces of any kind in Antarctica, people have promised not to put nuclear weapons of any kind in space or on the moon. Then there are two other treaties, the test ban treaty and the non-proliferation treaty which is to be reviewed later this year in Geneva. But SALT I, the treaty between the Soviet Union and the United States which has the effect of banning anti-ballistic missiles, is recognized to be an impermanent instrument of arms control if SALT II and SALT III don't quickly follow. But SALT II as we all know, is not going to be signed until the problem about Afghanistan is settled, until the American Congress also and separately agrees that it should be, and SALT III therefore remains in limbo. This is an exceedingly poor product of 25 years of really rather serious efforts by governments, statesmen and scientists to devise arms control treaties. It is also, in its way a depressing augury for the future.

Another of my frustrations is the way in which, over the years, the public policies of pretty well every government in the west towards nuclear power have faltered. Now, some of you may say that nuclear power is a bad thing and governments ought to go slow, and of course there are disagreements. But it does seem to me odd that in the 1950s, governments everywhere were saying that nuclear power is one way in which we can make electricity in plenty in the years ahead, and perhaps even cheaply; that in the 1960s, the same governments went slow on nuclear power partly because they thought that cheap oil would continue to be plentiful and partly because they had been given pause already by the arguments that nuclear power has hidden dangers. So now we've reached the point at which most governments are rather gingerly getting round again to the question of whether there should be a nuclear power programme and they are finding it much more difficult than it was in the 1960s because the word has got around that the public at large is on the whole afraid of nuclear power. Its frustrating because there is now a danger that this potentially important source of energy should at present be held in limbo when we are very short of energy.

There's a very similar case in the pharmaceutical industry. It used to be, again in the 1950s, that everyone welcomed what the pharmaceutical industry was doing. In the heyday of antibiotics when infectious diseases were falling down like ninepins, the public at large and the politicians were persuaded that the pharmaceutical industry was a good thing, that its business was a good business and that its products were entirely welcome. But soon there were arguments about how much the pharmaceutical companies should charge for their products, and then came to light all sorts of things—the side effects of Thalidomide and the side effects of other drugs. Now, it seems to me, we have an extraordinarily schizophrenic public view about the benefits or otherwise of the pharmaceutical industry. On the one hand, people still believe that practically every disease will be knocked off by some drug or another, but on the other hand, they are fearful of the side effects. The result is that governments everywhere are legislating for stricter control on the products which the pharmaceutical manufacturers hope to market and stricter controls on the way in which these drugs are used. Now there is a prospect, within the European Community, that regulations will require that if a manufacturer markets a drug, even if he has done everything he could to ensure that it is safe and even if he has a licence from a public committee to market the drug, if there are side effects then that manufacturer will be financially liable for the consequences. I think this is going to have serious consequences for the rate of innovation in the pharmaceutical industry. Indeed a great many pharmaceutical companies say that the trouble has already happened. The cost of innovations has increased. Worse still, the rate of change has decreased.

I list this as one of my frustrations because it seems to me that if there are ways in which the public could benefit from these drugs and if I'm right in saying that present attitudes are inconsistent, it is a pity that we are losing so many of these benefits.

Of course one of the issues that comes up—and this is another source of frustration time and time again—is what are our public policies like in relation to the application of technology? I suppose a good many of us have now forgotten the time in 1963 when Mr Wilson, then leader of the British labour party, said in Scarborough at the annual party conference that if he was returned to power, he would make sure that in one way or another Britain would rise to prosperity on the basis of a white-hot technological revolution. He had every reason to hope that he was right. The 1950s you will remember had been a time when the universities were expanding because governments believed that more scientists on the market would mean more innovation in British companies and elsewhere, more new products, more prosperity for us all. And by 1963 there was no reason to go back on this—indeed that was the year when the expansion of the universities with these objectives in mind was confirmed by the Robbins Report. So the time was ripe for a technological revolution.

Now, at that time there was no evidence at all that governments were good at choosing how best to spend money on technological innovation. There was no evidence at all that if they had picked the right field, they would have had the machinery for investing in that innovation the kind of money necessary to bring it to fruition. Indeed, such evidence as there was, in 1963, went the other way. Governments are less good than other kinds of organizations at making decisions about investment in innovations. And so it is not surprising that we were disappointed. Yet governments in this country and for that matter, governments elsewhere, have not given up the search for Mr Wilson's never-discovered technique for backing innovations with public money.

There is another sign that something is wrong. As we know, in this country our expenditure on research and development in defence, electronics, aircraft and so on is much higher than the proportion of our national product derived from these fields, while our spending on research and development in successful industries like chemicals is not as high as it should be if indeed we were hoping to win as much as we could from these fields. So that's another frustration. When will we discover—when will a government discover—how to do this job? And then of course, there is the frustration that comes from knowing that many powerful technological innovations are being neglected in our society and other societies. I'm thinking for example of telecommunications. We all complain about the post office or the corresponding organizations wherever we happen to live. But it does seem to me quite extraordinary that there should be such a gap between what we can get by way of a telephone service in our homes and the kinds of things which we know to be technically possible. I find it frustrating and a kind of scandal that it should cost so much more to travel to Rome than it now does to travel to New York. Why is it, I say, that this innovation, aircraft and the wide bodied jet in particular, should be so hamstrung by the ways in which governments choose to make deals with each other about who shall land where, how many times a week and so on?

These are all, I put it to you, genuine causes for frustration. You will make your own lists. Some of them may coincide with what I've said. Some may not. It doesn't matter if there are mismatches between our different views. But I want to make another complaint before I go on to say or suggest what might be done. I want to complain that quite apart from the ways in which public policies often neglect the potential of science, there are also times when they make too much of them. It was exciting that the Americans managed within the decade of the 1960s to send a man, several men, to the moon. I still believe that the $20 billion spent on the Apollo programme would have been better spent on some other kind of project. Here's another example: Mr Carter, the President of the United States, said earlier this year that thanks to plans he proposed putting before Congress for research and development in solar energy, by the end of this century 20% of the American production of energy would be solar energy. It so happens that today, the new Secretary of Energy in the United States, Mr Duncan, is having to face a very hostile committee of the House of Representatives because the Congressmen want to know what's being done to fulfil this promise. Mr Duncan being the kind of man he is, is going to tell them that not merely has very little been done but that he personally doesn't believe that anything can be done to bring about such a great shift in the American supply of energy in the short period of the next 20 years. So that again, it seems to me, is a case where, for reasons that we have to guess at, an exaggerated promise on behalf of science and technology has been made and believed. I don't want you to think that I'm getting at the Americans. I simply mention Concorde as an illustration of what can happen in this country.

Those are our frustrations. What are we to make of them? It's important to remember that issues in public policy are never entirely matters of science and technology. If one follows through what's happened in nuclear energy, one comes to a rather good understanding of why it is that people like us are frustrated, and from that one can derive a kind of understanding as to how it can be put right. In the 1950s, when people were on the whole cheerful about nuclear energy, there were already some doubts about the safety of this new way of getting energy. You remember that in the 1950s not merely were people building the first nuclear power station, they were also testing nuclear weapons in the atmosphere. I was one of those then who argued strongly that the testing of nuclear weapons in the atmosphere was potentially dangerous and, indeed, if you worked the figures out and if you work them out today, the answer is still the same—the accumulation of radioactivity in the atmosphere would have been dangerous not just to those countries responsible for testing nuclear weapons, but for the world at large. In some funny way that argument didn't quite stick. Only in the 1960s did people worry seriously about the dangers of radioactivity. My own personal belief is that this upsurge of concern about radioactivity and its dangers was a part of the movement to be solicitous of the environment.

Part of the problem arises from living in a democracy as we do. You cannot blame politicians if they say one of the reasons they are less keen now on nuclear energy than they were in the 1950s is that they are responding to the concerns of their electors, their constituents. If it's true that the general public is worried about the dangers of nuclear power, if it's true that the general public will not have nuclear power stations built near them, if it's true that the general public would prefer the government not to have nuclear power stations, you cannot blame politicians, you cannot blame the civil servants for trimming their policies to suit that need and certainly you can't blame governments whose prime democratic job is to do the best they can within acceptable seemly principles to get re-elected.

Now, it seems to me a great misfortune that nuclear power has so much to offer in the way of being a novel source of energy at a time when the price of oil is high and the supply of oil is unpredictable; it seems to me sad that we cannot use it. I think nevertheless that we have to acknowledge that governments are not as brave as they might be, but the public concern is frequently said to be irrational. That, in my opinion, is the wrong word to use. The public's concern stems from unfamiliarity with the kind of risks that radioactivity entails—to die of cancer after ingesting radioactivity is quite different from breaking a leg on a skiing holiday or even being hurt in a motor car accident in a car that one is using oneself to get from A to B. The risk is novel in kind. The way in which people have reacted is the way in which over the decades and even the centuries they have reacted to startling innovations.

So why do some people say it's irrational when people are like that? They really mean that the public view doesn't coincide with the scientific view of what the dangers of nuclear power are and how they compare with other kinds of risk. But people are fearful of the one in 10,000 risk of dying of cancer after absorbing a year's permitted radiation dose for shall we say a decade on end. They are not persuaded by the arguments of scientists who have come to the conclusion that risks like these are the kinds of risks that one really has to accept as a part of one's place in civilized society. I believe that to be a fair statement of the truth, but we have to accept the empirical fact that it's the public view, not the scientific view, that determines how parliaments and governments behave. That's how it should be in a democracy.

Second, if for some reason the scientific view hasn't been translated into public opinion, in a sense the responsibility lies not with the public but with the scientific community. Now I appreciate, in the case of nuclear power, there's a problem, because the scientific community is itself divided on how best to measure and assess the risks of radioactivity. The issues are exceedingly complicated and it is frequently said that they are too complicated to be explained to the general public. My comment is this. I do not believe that any of these issues is too complicated to be explained to the general public. If you think back 15 years to some earlier crisis in our financial affairs in this country, you find people bemoaning the fact that the general public has no understanding of the relationship between inflation, unemployment and all those things. And if you read the newspapers now, you find them much more sophisticated in their discussion of economic affairs. The general public has taken on board an understanding of how the economy is run. And that has happened in a quite short space of time. If people like me are frustrated by government's neglect of nuclear power, then we really have to do something to make sure that the public comes to a better appreciation of what the risks really are and we can do that only by satisfying one prior condition—that the disagreement there is within the scientific community must be first properly argued out.

One of the saddest things about the way in which the scientific community functions is its politeness over quite substantial disagreements. People can be exceedingly impolite about small disagreements. They can really tear each other apart, verbally at least, on the questions of whether or not a student should be admitted to a department. But when they disagree on serious matters like arms control or nuclear power or the dangers of new medicines, they tend on the whole to regard a statement of their view as sufficient for other people to come to some kind of consensus. I think that's bad. Until the scientific community is able to face up to these internal disagreements, then people like me will continue to be frustrated at the neglect of nuclear power and many other things.

But governments can also do a lot to help. On the issue of drugs, government could help simply by making the point that there are very few activities in this world, very few benefits that you can derive, which are entirely free from risk. Governments too could be more courageous, but I don't expect them to be able to solve all these problems on their own. On questions like nuclear power, the scientific community has a particular obligation to be forthright, outspoken and respectful of the public view. The scientific community has a responsibility, when it comes to pork-barrel science and technology, if I may call it that—the Concorde, the Apollo programme, Carter's solar energy programme. There were very few complaints in the United States when the Apollo programme was launched by President Kennedy that this was a gigantic risk of money and more especially of talent. One or two people complained. Most people were willing to accept the research grants they could now more easily get from the larger budgets available. The same with Concorde. There wasn't much of a row about it except on the rather narrow issue of whether it would make environmental trouble or not. People didn't protest that Concorde itself by being a sure money loser from the start couldn't possibly be justified as such a great consumer of money and talent for such a long period. I think that therefore the scientific community has perhaps a special responsibility to protest about these excesses, these attempts to make use of science and technology as ways of achieving political or other ends.

The question of what's to be done about Sir Harold Wilson's problem is a much more difficult one, I acknowledge. We have, it seems to me, over the years put up with the very arbitrary distribution of the scientific resources of this country in the development of aircraft, defence, electronics and so on while watching other kinds of innovations being exploited successfully and commercially elsewhere. We only have to think of last year's great excitement about micro-processors and to compare that with the way defence electronics has taken a very large share of the British research and development budget for the past 30 years to be puzzled to know why some of the benefits of micro-chips did not grow up in this country in the first place. There's something wrong. Governments inevitably find themselves committed to projects they have under way already. They find it inconvenient to make major changes at any time and so, if the distribution of resources is wrong, it stays wrong.

The other problem is that in trying to use public funds or even the goodwill of governments to foster this or that innovation, you discover that the motives of governments can never be simple. Governments are not like companies. They're not in business to make money. They are in business to square all kinds of political circles and so it's not surprising that frequently quite imaginative expenditures on new industries are used not merely to bring about a technological innovation but actually to solve half a dozen other problems as well—the provision of jobs, the redistribution of industry within the country and so on. I am not clear where I stand on this issue because perhaps I am too sympathetic of the political problems with which governments are afflicted. But it does seem to me wrong that so many of these policies for the backing of industrial innovation should be such ambivalent programmes, designed to solve half a dozen different problems at the same time and not just to improve the chances of an innovation.

What do I conclude? It is in my opinion entirely right and proper that every single working scientist in some way or another should have a profound sense of the disappointment and frustration at the way in which some idea, some innovation of which he knows, is being neglected. I haven't wanted to depress you by making such a long list of my own personal frustration but everyone, if he asks himself will be able to compile as long a list. It's also, I think, the case that working scientists, the scientific community at large, are still as much buoyed up by that naive belief that science and technology can help to improve the world in which we live. And we can make lists of the ways in which we can see how things could indeed change for the better. I think that inevitably it must rest with the scientific community to tackle the problem. I do not believe in the present circumstances it is sufficient for scientists to go and sit on government advisory committees and tell civil servants what might be done with 10 million pounds here, 10 thousand pounds there and so on. It is absolutely essential that the scientific community should resolve its own internal differences, or at least make them clear, and that it should regard it as its first obligation to make its case to the general public.

I've also made some points about the things that government may do. Government has had a bad press all over the world. We must acknowledge, in spite of the political contradictions that they have to live with, day in and day our, that they too must be much more open, much more leaders than led.

I said at the beginning that I was taking as my brief two-thirds of what you may have understood by my title. I want to make one point about the other third. It seems to me that the conviction in the scientific community that science and technology are broadly speaking good things would carry more weight with the general public if the general public knew more of what is going on. It seems to me that this again is a task that the scientific community itself must undertake. The scientific community in this country is now under serious threat not merely from lack of funds but from the way in which the scientific community is organized. For example, the universities are constitutionally under threat, financially under threat. In all kinds of ways, it's hard to be competitive in Britain, much harder to be competitive in Britain than in the United States, with the result that young people aren't stimulated by university to do even better than they have been doing. And then, it is no longer possible for a person with a good idea, a bright idea, to know that a university will give him a job where he can prosecute his research not merely on his own but with the help of colleagues. This is no longer possible. It is cutting away at the spirit of the scientific community.

I didn't want to make a special plea for the scientific community as such. The world does not particularly owe it a living. The world really has no particular reason to be fonder of the scientific community than other kinds of communities there may be—law, social science and so on. I think the scientific community itself has a responsibility not merely to itself but to the community at large to draw attention to the way in which it is now under threat. The most effective way in which it can do that is to set about its own reorganization, suggesting ways in which perhaps the university problems can be dealt with, at the same time doing something to change the way in which the public regards the whole scientific enterprise.

Unless in one way or another the public has a decent regard for science—in which I include technology—then the public is not going to vote funds, the public's representatives in parliament are not going to do the kind of thing the scientists would like and in one way or another, the case for thinking that science can benefit society will go by default. It's a lot for the scientific community to do. I think in the present circumstances it has no choice.

Some considerations relating to the cost-effectiveness of online services in libraries

F. W. Lancaster

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IN 1978 Collier[1] presented some hypothetical data on economic aspects of the use of online services as compared with subscriptions to printed services in libraries. Collier's view of the economics of online searching seems misleadingly pessimistic because:

1. It looks only at *costs* but not at *effectiveness* in comparing the two modes of access and searching. An analysis combining cost and effectiveness aspects (ie, a cost-effectiveness analysis) would give a completely different picture.
2. The way the cost data are presented is grossly unfair to the online mode of access and use.

The data presented in a series of tables by Collier are shown combined in Table 1. The table represents a hypothetical data base under varying conditions of use. Cost of producing and distributing the data base is assumed to be $3 million. Total cost for online access, taking all elements into account, is assumed to be $80 per hour, which was said to be a realistic figure for European access in 1977. In fact, this seems quite a realistic figure for the situation in the US as well.

In situation A, there is no online use. At a subscription rate of $2500 annually, 1200 library subscribers would be needed for the publisher to recover the $3 million investment. The total cost to the 'library community', Collier points out, is $3 million. In actual fact, it would be more than this, perhaps, $3.6 million or more, if cost of storage and handling in 1200 libraries is taken into account. Studies at the University of Pittsburgh (Kent *et al.*[2]) suggest that the real cost of owning a serial publication could be at least 20% more than the subscription cost alone. Situations B, C, E and F suppose no income from printed subscriptions. The variables here are the per hour royalty charges and the number of hours of online use. Total online cost per hour also varies in E. In B, with royalties set at $20/hour, a huge 150,000 hours of access would be needed for the publisher to recover his investment. Since the total cost of online access is $80/hour, Collier is correct in stating that the total cost to the library community would be $12 million a year. Clearly, as the royalty rate is increased, the number of hours of access needed to recover data base costs declines. In C, at $40/hour royalty, 75,000 hours of access would be needed. In E, with royalties of $100/hour, and total online costs of $150/hour only 30,000 hours of access are needed. Total costs to the library community are $6 million and $4.5 million in these situations. The total cost to the library community is brought down to $3 million a year in alternative F. But, with royalties set at $30/hour and access hours set at 37,500, this option would bring a loss to the publisher of almost $2 million a year. Situation D is a mixed income example; with cost of an annual subscription set at $3000 and

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TABLE 1. *Alternative pricing strategies for print on paper and online access. After Collier*[1]

	A	B	C	D	E	F
Cost of producing & distributing data base ($)	3 million	3 million	3 million	3 million	3 million	3 million
Online royalty income ($)		3 million	3 million	900,000	3 million	1.125 million
Royalty charge per hour ($)		20	40	30	100	30
Number of hours of online use		150,000	75,000	30,000	30,000	37,500
Total online cost per hour ($)		80	80	80	150	80
Number of subscribers to printed index	1200			700		
Cost of one annual subscription ($)	2500			3000		
Subscription income ($)	3 million			2.1 million		
Total cost to library world	3 million	12 million	6 million	4.5 million	4.5 million	3 million

royalties set at $30/hour, 700 subscribers plus 30,000 hours of online access would allow the publisher to recover his $3 million investment. Obviously, different figures could be inserted into Collier's framework to assess the economic effects of declining subscriptions, increasing subscription costs, increasing royalty charges, and increasing levels of online access.

Collier does not explain how, in alternatives B, C, D, and F, it is possible for online royalties to vary from $20 per hour to $40 per hour without a concomitant variation in total online cost per hour. This, however, does not affect my particular argument, so I will use Collier's figures as he presented them.

Collier's analysis is certainly interesting, and his figures, while hypothetical, accurately depict the difficult pricing decisions facing publishers who issue a data base in both paper and electronic forms. Nevertheless, his conclusions on impact on the library community are misleading, for the following reasons:

(1) The cost to a library of owning the printed service is more than the cost of the subscription. Storage, handling and other costs could add another 20 per cent to the cost of the subscription, possibly more for some subscriptions in some libraries.

(2) A printed service that costs $2500 a year to subscribe to, plus $500 a year for other costs, represents an annual cost of $3000 a year to the library for *data base access alone*. That is, the cost to the library is $3000 a year even if the printed service is never used. The data in column A, then, can be considered costs incurred even if no searches are even undertaken. This is quite untrue of the online situation in which access is paid for only when necessary.

(3) Collier's $80 per hour for online costs to the library includes $10 for 'equipment, training and terminal operator'. In other words, Collier is charging personnel costs of searching the data base to online use but not to the printed service. Let us assume that the librarian conducting online searches is paid $8 per hour (Collier's $10 minus $2 for training costs plus terminal use) and that 4 online searches can be done in one hour of access. Looking at option C in Table 1, 75,000 hours of access would represent 300,000 searches. It seems reasonable to assume that these searches, if conducted in the printed data base, would take much longer to perform. A conservative estimate is that each search would take twice as long in the printed tool although this ratio could be as high as 8:1. I will assume a low 2:1 ratio. In other words, the 300,000 searches would take 150,000 hours of librarian time at $8 per hour, or a total of $1.2 million. Therefore, a more realistic cost of situation A to the library community, assuming 300,000 searches a year, and taking storage and handling into account, is $4.8 million. This is a more valid comparison of situation A with situation C because C takes into account all costs of 300,000 searches (excluding printout or photocopying costs and time taken for 'negotiation' with the requester, which I will assume to be equal in the two situations), whereas A represents only subscription costs, assuming no level of use. It is not difficult to see, of course, that if the average time taken to search the printed tool is three times that needed to search the online data base, the cost to the library world of alternative A, assuming 300,000 searches, would be $5.4 million, which is close to the $6 million of situation C. If the average time taken to search the printed tool is 8

times greater, the cost to the library world of alternative A would be $8.4 million.

(4) Collier's analysis takes into account costs but not effectiveness of the two modes of literature searching. It is a cost analysis but not a cost-effectiveness analysis. If effectiveness is taken into account the situation changes completely. To achieve the same level of effectiveness in a search of a printed data base that is achieved in a search of the online equivalent (eg, measured in terms of recall) it could easily take 8 times longer (if, indeed, it would ever be possible to reach the same level of effectiveness). If cost-effectiveness is taken into account, then, the situation A costs could easily be around the $8 million level, if not more.

But these figures are largely hypothetical. Let us, instead, use some real cost data. The most complete and realistic comparison of the cost of online searching versus searching of printed tools is, I believe, that performed by Elchesen[3], based on 80 searches conducted in the United States. According to Elchesen's data, a print search takes between 4½ and 5 times longer, on the average, than an online search (119.5 minutes as compared with 26.7 minutes). If only *searching time* (ie, excluding time for question negotiation, photocopying, output processing and distribution, etc.) is considered, however, the print searches take 8 times longer than the online searches (89.6 minutes as compared with 11.6 minutes). The average cost of an online search was computed by Elchesen to be $26.05, whereas the average cost of a print search was computed at $30.15. These are true cost figures that take into account all of the following factors: personnel costs (professional and clerical), data base access costs (including subscription costs for the printed services and connect time plus royalties for the online mode), reproduction costs, costs of equipment purchase or rental, space costs, and telecommunications costs. Overheads are built into the personnel costs and the space costs.

The appropriate cost-effectiveness measure to use in the comparison is the cost per relevant reference retrieved. This is computed by dividing the total cost of the search, online or print, by the number of retrieved references judged relevant by the initiators of the searches. In the Elchesen analysis, the average number of references retrieved per search was 35.2 for the print situation and 47.1 for the online. The average number of *relevant* references retrieved was 35.2 for print and 39.8 for online. The computed recall ratios were 43 per cent for print and 57 per cent for online. The precision ratios were 100 per cent for print (hardly surprising since the searcher is making relevance decisions continuously as the search is conducted) and 84 per cent for online. The cost per relevant reference retrieved was $0.86 in the print situation and $0.65 in the online.

If we insert Elchesen's data into column B of Table 1, 150,000 hours of online time will account for 750,000 searches a year, which will cost the library community $26.05×750,000, or approximately $19.5 million. (While it may seem dangerous to extrapolate from 80 searches to 750,000 searches, I believe such extrapolation is entirely reasonable in the present case. If 5000 libraries each perform 150 searches a year, there is no real reason to believe that, on the average, the cost and level of effectiveness per search will vary widely from Elchesen's data). In contrast, 750,000 searches conducted in the printed tool will cost $30.15×750,000, or approximately $22.6 million. This is a much fairer comparison than that provided by Collier, who charged total costs to the online side of the comparison but not to the print side. In Table 1, it is meaningless to compare column A with column B, since B represents about 750,000 searches, and no searches at all are present, explicitly or implicitly, in column A. As mentioned earlier, the column A costs are incurred even if the printed tools are never opened.

Even on costs alone, then, the online mode of operation compares favourably with the print mode when realistic cost figures are used in the analysis. If cost-effectiveness is considered, however, the comparison favours online more strongly, since Elchesen's data indicate that online searching is about 33 per cent more cost-effective than print searching ($0.65 per relevant reference retrieved as opposed to $0.86 per relevant reference retrieved). At 750,000 searches a year, then, the cost to the library community on the printed tool side is $22.6 million, while on the online side it is $19.5 million. To raise the level of *effectiveness* of the printed tool side of the equation to the level of effectiveness implicit in the expenditure of $19.5 million on the online side, it would presumably be necessary to multiply the $22.6 million by a factor of about 1.33. From a cost-effectiveness point of view, then, the comparison greatly favours online operation since, to achieve the same level of effectiveness as that achieved online for $19.5 million, the library community would have to spend approximately $30 million a year using the printed services.

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Developing an information policy

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Aslib has recently told a House of Commons Select Committee that there should be a 'national information policy'. What is desirable on a national scale is good at the level of the individual enterprise too. The present article is an account of the development of an information policy as the culminating point of a consultancy assignment for an organisation.

What is and why an information policy?

IT IS A COMMONPLACE today to say that enterprises are increasingly information-dependent and that if they are to survive and prosper they must be able to identify, obtain and exploit the knowledge that is essential to meet their aims.

Less commonplace, but beginning to gain currency, is the idea that to achieve these things enterprises need an information policy, just as they have an investment policy or a marketing policy. Sir Alastair Pilkington's presidential address to the 1979 Aslib conference embodies this kind of thinking, in its statement that 'Success in a company is better decisions resulting in a better company'[1] and its call for information providers to contribute to better decisions by 'coming off the touchline and joining the team that has to make them'. So too does Wilkinson's question: 'Whereas every company has a finance director and a personnel director and most have a technical or purchasing director concerned with the industry's raw materials, is there any with an information director on the board?'[2]

An information policy covers the *information needs* of the organisation, the *information inputs* required to meet them, and all the *systems* in the organisation that handle information. It is defined in relation to the *objectives* of the organisation, to what it thinks it is in business for. It is created through the co-operation of the professionals responsible for information services, and those responsible for deciding on the organisation's objectives. It incorporates guidelines for resource provision for the information function. Once it is in existence, it must be monitored in the same way as all the organisation's policies are monitored to see that it goes on being appropriate for its purposes. Above all, it must be understood and actively subscribed to throughout the organisation.

If this degree of commitment to an information policy is achieved, it means that whatever is done in the name of information service can be related to the organisation's overall objectives, and can make a direct and active contribution to them. It minimises

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the risk of wasting resources devoted to information on doing things that are of no practical use to the organisation. It promotes interaction between users of information and those who are responsible for meeting their needs, and it helps to ensure that the staff of the organisation work effectively from a sound information base.

Background

An opportunity to apply this kind of approach arose in the Construction Industry Training Board in 1979. The Board was one of the earliest of the industrial training boards set up under the Industrial Training Act of 1964 to improve the provision for training of 'persons over compulsory school age' in their industries. While its responsibilities under that Act and under its successor, the 1973 Employment and Training Act, involved the collection of information about training and manpower in the construction industry, and the provision of information to the industry in the way of advice, published guidance, and direct training, it did not have a professionally staffed information service to support its information gathering and providing activities.

The need for such a service was identified over a period of years by the people in the CITB who had the responsibility for direct contact with the industry—the staff of the Board's training services. Their thinking about the problems they faced in gaining access to the information needed to do their jobs as effectively as possible was crystallised in the report of a conference of the Board's training services in 1978. This indicated the types of information needed to meet the Board's objectives, defined existing information resources within the Board, and identified areas where lack of information was making the work of training staff more difficult and less effective.

Some examples will show the nature of the information problems presented:

(a) Staff responsible for planning new training projects felt the lack of a flow of information from their field colleagues—those in direct contact with construction firms—about suitable topics for new projects that would meet a perceived need in the industry.

(b) The people engaged in developing training materials expressed their need for information on technical developments, new training methods, and options for the presentation of training materials.

(c) Field staff were often asked by firms for information about existing courses for highly specialised subjects, and lacked a reliable source of advice for this purpose. In preparing for visits to firms, they felt the need to be able to draw on background material about the firms, including annual reports, details of previous CITB visits, etc. Many staff felt they were inadequately briefed about the Board's own activities, and about its training products.

(d) The specialised knowledge and skills of many members of the Board's staff were seen as a valuable information resource for their colleagues, but there was no means of accessing it.

(e) Training advisers moving into new subject areas in their work—for instance interpersonal skills training—needed advice on background reading so as to prepare themselves. Staff engaged on writing training publications wanted to be able to draw on information about current British Standards, and about building products.

As well as identifying information problems, the people who attended the conference suggested a solution: the setting up of a 'Training Resource Centre' which would bring together in one place much of the required information and which could act as a 'clearing house' for access to information held elsewhere.

A decision was made early in 1979 to take steps towards setting up such a centre. Advice was sought from a consultant who had set up the information service for another large industrial training board. She was commissioned to:

—identify areas where CITB staff needed information to meet objectives and do their jobs effectively
—identify information resources needed to meet these requirements
—identify priorities in the development of an information service, in relation to the Board's objectives
—indicate resources required for setting up and development
—advise on the appointment of an information professional as manager of the centre
—work with the manager, when appointed, on defining the scope of the centre's activities (including its relationship with existing systems and collections of information in the Board); its objectives; its key areas for development; and its resource needs for the short and long term.

Once the manager was in post, he and the consultant quickly came to the agreement that the most useful thing they could do to round off the consultancy assignment and get the Training Information and Resource Centre on its way was to interpret the final clause as being an instruction to produce an information policy which would help:

—the CITB in general, by promoting an agreed understanding of the information function among the Board and its staff, as a basis for developing information systems that would contribute to the Board's objectives and strengthen the work of its staff
—the Training Information and Resource Centre and its manager, by defining the Centre s scope in relation to other information systems in the Board, and its manager's area of authority; and by providing opportunity for development in that area, a basis for initiatives, and a reasonable guarantee of resources for development to meet agreed needs.

The statement of policy would be addressed to the top management of the Board, the members of the Board (representatives of employers and unions in the construction industry, and of the further and higher education system), and the headquarters and field staff of the Board.

Practical policy design

Gathering information and facts about the internal workings of the CITB and their information requirements involved considerable discussion with Board staff. For the newly appointed manager this was not only a 'finding out' interview regarding information requirements, but also an introduction to new colleagues. After two or three weeks this proved to be a big bonus since consultant and manager had the advantage of having one person 'inside' the organisation, needing and wanting to get involved with a new job, people and environment, and one person 'outside', who although now known and trusted by the organisation (having been associated with them for several months), could take an objective overview. This meant that she could act as a 'sounding board' for the manager's ideas, and offer possible solutions to problems encountered in practical day-to-day working. This formulation of ideas talked-out and debated while the information policy was being drawn up by one person inside and one outside the organisation must offer a better chance of success than the short-term contract offered to outsiders to enter an organisation, determine its needs, write a report on its information requirements and then depart. If as a result of this process an information person is appointed, he or she will be left to carry through an outsider's ideas of what should be done, having had no say in their formulation.

A detailed organogram of the Board, and discussions with the Director responsible for implementing the information policy, were the starting point for formulating ideas. New policies could then be considered within existing constraints.

Personal introductions by the Director, and Sector Head, to whom the Information department answers, were considered to be most useful in establishing from the start the level and importance attached to the newly created department, and ensured that people were encouraged to discuss and present their problems regarding information provision. Consultation with the whole spectrum of Board staff was considered essential, and this involved visits to Field Offices, Administration HQ and specialist departments. The results of such discussions provided the raw material around which an information policy could be designed, with the prime aim of overcoming such highlighted problems.

Background reading of the Board's annual reports, publicity material, course brochures, house journals, and press releases was essential in getting to know and understand the working of the Board; this knowledge could then be reflected in the information policy.

Visits, and contacts with other ITBs and organisations concerned with the Board's subject areas of construction, education and training, were important. The policy could incorporate the best practical solutions and ideas of such other bodies who already had established working information services.

The share-out of work between consultant and information manager reflected the already outlined areas of 'outside' theoretical overview, and 'inside' practical problem areas. A careful blending of the two, and continual dialogue, meant that the information policy could be based on theory and related to researched problem areas, and as such incorporate practical solutions.

The scope of the policy

The policy covered the range defined earlier: information needs, inputs to meet them, and systems. The needs were for whatever information was essential to enable Board staff to do their jobs effectively. The inputs could be briefly defined as:

—information from the Board's own activities; its own policies, documents and products; and the results of its interactions with firms—levy/grant statistics, feedback from field staff, etc.

—information from outside the Board, relating to institutions of importance to it (its so-called 'upstream customers')—the construction industry, government, the education system, trade unions.
—information from outside in the form of published material—reports, books, periodicals, trade literature—in subject areas relevant to the Board's objectives.

So far as the systems handling information were concerned, there were already a number of existing ones which had been created to meet specific needs of the Board. Among the most important were the systems holding statistical information linked with levy/grant operations, those which consolidated field area training statistics, and those which used outside statistical data to produce strategic reviews and manpower forecasts. To these was now added the new Training Information and Resource centre. Since this was a new element, particular attention had to be given to defining its role and its relationship to existing systems, for it would have been superfluous and unrealistic to try to take on a co-ordinating role in relation to systems already existing in their own right.

The use of the Board's objectives in defining information policy

Developing an information policy is greatly helped if the organisation has taken steps to define its objectives; even if the formal written objectives are not actually pursued, they make a useful anchor! In the case of the Construction Industry Training Board, its overall general objectives are the basis for all its planning, and for establishing objectives, key result areas, targets and criteria for achievement of departments, teams and individuals. The major objectives of the Board are:

—to maintain and improve the standard of existing training services and products
—to exploit opportunities to develop new training services and products to meet the needs of the industry
—to improve the cost effectiveness of its own affairs
—to work closely and positively with the Manpower Services Commission (the body to which all industrial training boards are answerable and from which they derive their operating expenses) in the provision of services which may go beyond the immediate needs of the construction industry.

All of these objectives were seen to have information implications. The first two implied a need for information to be used by the Board's staff, for example, knowledge of current developments in training methods, and feedback from the effectiveness of existing services and products. The objective of cost effectiveness required that training staff should be able to spend the maximum amount of their time exercising their own special skills effectively, rather than searching for information or, lacking it, duplicating existing work, and that the information base from which they operated should be reliable, up to date, and readily accessible.

Meeting the final objective required that the Board should be able to monitor information about manpower and economic developments so as to be able to identify appropriate policies for services going beyond the immediate needs of the industry.

Having identified the information implications of the Board's objectives, it was a short step to establishing some objectives for the Board's information policy:

- —to draw on all appropriate resources of information, originating outside the Board or from the Board's own activities, to meet the needs of the Board and its staff in fulfilling their objectives
- —to organise the resources of information in appropriate systems, using suitable technical means of information handling
- —to promote inter-relations between the various information-handling systems, and to develop interaction and feedback between users and providers of information, so that the development of the Board's information activities is fully integrated with its policies.

Defining a role for the Training Information and Resource Centre

Having collected future customers' ideas of the services they would expect from their own information service, it was important to convince them that their ideas had been heeded. The Board's house journal proved a useful means of achieving this.

An early invitation from the Board's Public Relations Manager to write an article for the house journal was taken up. The article served as an introduction to far-flung parts of the Board, and to those people it had not been possible to meet personally when gathering thoughts and ideas for the policy. Its appearance also produced more discussions, ideas and feedback from Board staff.

The article covered first thoughts about the kind of service proposed; it looked at previous problem areas, and offered solutions. Without going into too much detail, it outlined the kind and types of material to be collected, and the possible future range of services, while not promising an 'instant' Resource Centre.

The previous existence of a library of books, pamphlets and British Standards which had been 'in limbo' for two years, and then transported to a new location ready for the 'new information service', in some ways compounded the problem of a new start. People expected instant service, although the previous collection had not been set up on professional lines, and therefore defied attempts to build on the previous systems of cataloguing, classification, and arrangement. The establishment of the new service as the 'Training Information and Resource Centre' was a help in getting away from the purely 'custodial' library image which had existed previously. On that basis it was possible to speak of the full range of information material; not only the existing books and pamphlets, but also audio-visual materials, relevant periodicals, and reference sets of the Board's own publications and training aids. Most important of all, the Resource Centre could offer a point of contact for information seekers. The ensuing contact and dialogue would enable an initiating service to develop, rather than a passive one.

These ideas also went into the house journal introductory article, and were frequently referred to in subsequent conversations and talks to visiting groups. Explaining to future users, in jargon-free language, what one is trying to achieve is very much a public-relations exercise. Reaction to a user's first inquiry is vital and can set the level and standing of the department for the future. Here one's professionalism can be unobtrusively demonstrated by speedy response even without an instant answer, but by continual up-dating on how the inquiry is progressing. In many cases what has seemed like a complex question can be answered rapidly by one reference book, or a well-directed phone call. The lack of such a service previously makes such easily obtained results appear to be 'magic' to the uninitiated inquirer! The benefits of a professional information handler can therefore soon become apparent.

As ideas crystallised, proposals for a practical plan of action were written as an appendix to the information policy document. This spelt out departmental needs, nature and scope of collections, and future development plans. It took the form of a statement of existing circumstances, followed by an outline of the action proposed by the new Resource Centre. Similarly, the benefits accruing from certain types of materials were assessed, and the actions proposed to collect and make these available were set out.

Resources for development

The itemising of the various collections of material, and of what was needed to up-date, rationalise and cover all subject areas of the Board's work, provided a useful listing for drawing up budget estimates.

Outline estimates for expenditure in the forthcoming financial year were included in the appendix to the policy statement. So too was a longer-term (five-year) plan of developments; this included estimates of manpower requirements and proposals for investment in information technology (use of the Board's computer and of videotex).

It was felt to be important to include in the policy statement, clear indications of the resources required so that it should be understood that commitment to the policy meant commitment to providing reasonable resources for agreed development. A policy without some guarantee of resources would not be worth the paper it was written on, let alone the effort of writing it!

Conclusions

Having worked through the preparation of a statement of information policy, we would summarise the value of such statements, jointly drawn up by outside consultant and in-house information manager, in the following terms:

(1) An information policy makes it clear what the information function is, and defines the role of the information service and its staff, and what services can be expected from it. It also defines where such a service fits in and interacts with other information-handling parts of the organisation (this is especially important in an organisation which has never had a professionally run information service).

(2) The policy statement provides an authoritative source of reference for the management of the organisation of which the information service forms a part, and for the information service manager. Acceptance by management of the policy can be taken as a reasonable guarantee of resources and commitment!

(3) It provides a basis for monitoring progress and reviewing policy to meet changing situations.

(4) It helps to ensure that information needs and information exploitation are taken into account in all policy decisions and all forward planning

(5) It defines the role and standing of the information centre manager and provides him/her with a basis for initiatives which can be taken without constant reference to top management.

(6) The combined effort by outside consultant and inside professional means that what they propose has the double authority of (a) someone with experience of other systems/organisations whose work has been accepted by the commissioning organisation as sound, and (b) someone who, as a member of the organisation's staff, has the opportunity of day-to-day interaction with colleagues and of gaining through it respect for his/her judgement. Interaction of the two means that the consultant's ideas are moderated by the manager's findings in practical day-to-day working, while the consultant can offer ideas from outside experience which can be evaluated for application in the present situation.

(7) Interviewing users and collecting details for a policy provides an opportunity for public relations on behalf of the information function within the organisation, for re-stating information thinking at a basic level (eg, to focus attention on the benefits of an information centre and encourage its use, instead of duplication of effort and time-wasting floundering in the pursuit of information). It is a chance to demonstrate that information handling is a profession in its own right, and that it should be treated as such.

A two-pronged attack by outside and inside information practitioners carries some weight!

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School librarians at Bath University library: a social science case study

Anthony Holbrook

Bath University Library

The University of Bath's 14 schools are each allocated a specialist assistant librarian—the school librarian—to help liaison and collection building. School librarians have similar general roles but the school of Humanities and Social Sciences is a disproportionately heavy library user. The collection serving this school has been substantially improved for undergraduates since 1976. Short loan material has been drastically reduced while issue and satisfaction levels have risen considerably. A variety of other improvements have been made although research and postgraduate needs have received less attention. A number of factors affect relations with the school. The school librarian scheme is well established and successful but some difficulties remain.

Introduction

BATH UNIVERSITY LIBRARY is known for its pioneering work to establish a short entry catalogue and as a centre of library research beginning with INFROSS and continuing as a focal point for catalogue studies. Less publicized is the structure of school librarians whose main objective is to ensure adequate subject collections. The paper will first place them in their library and institutional context and then describe the problems faced in the Social Sciences in 1976. A brief review of the major improvements in this area is followed by analysis of the merits of the school librarian structure. Further consideration of the role and objectives of subject specialists in academic libraries can be found in useful papers by Guttsman[1] and Crossley[2].

Staff Structure and role of School librarians

The modest staffing establishment at Bath consists of the University Librarian and his deputy; seven school librarians on senior library staff grades; nine senior library assistants based mainly in or supervising functional sections; and sixteen library assistants. This is to meet a student population of 3,600 including 575 postgraduates. The proportion of postgraduates has been rising slowly each year in line with university policy to expand research.

While the Librarian and his deputy are occupied with policy and administration the school librarian's role is much less clearly defined. Full discretion, with little in the way of set duties, is given to develop services in line with school and subject needs. Woodhead's[3] paper illustrates the UCL subject specialisation scheme which exactly reflects Bath: 'Each specialist is responsible for almost all aspects of the administration of the library in his particular subject or subjects'. Another parallel is given by Crossley[2] at Bradford where the subject librarian's 'most important function is to build up collections adequate to meet the needs of staff and students in their Boards'.

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Liaison with respective schools is a key function for Bath's school librarians. They act as a link between school and library ensuing academic needs are met as smoothly as possible. The school library representative can be a useful part in this process. Formal contact may include attendance on the Board of Studies but most liaison is informal, each school being informed by their librarian of changes in library services and the subject collection. All the university's major academic activity is contained within the 14 schools, precluding any faculty or departmental structure. School librarians are based in the library and responsible to the Librarian rather than the head of the serviced school. Much time is taken with collection building through a balanced acquisition policy of new or extra copies, many of which are selected after checking of staff reading lists. Requests for new periodicals are directed to school librarians. Work patterns and priorities vary with individuals but other tasks include the need to supervise the growth and signposting of subject material; the consistency of classification; stock usage and loan categories; the physical condition of the collection, eg, repair, replacements, etc; overview inter-library loans; give advice to cataloguers on difficult texts; arrange with them necessary reclassification. There is also a small amount of inevitable clerical routine such as book order queries and inter-library loans.

Nearly all library instruction is in the hands of school librarians while their siting adjacent to subjects ensures a wide and steady range of enquiries. Although officially designated assistant librarians/information officers the time available is usually insufficient to run personal SDI systems other than on a most restricted scale. Information services have been confined mainly to circulation of current awareness bulletins, notification of new books via subject accession lists and help with literature searches, namely the demonstration of most appropriate sources. Computerised searches have however become more popular. Monthly school librarian meetings with the deputy librarian help formulate policy and disseminate news. Apart from oversight of school book expenditure, occasional late night supervision and committee attendance the school librarians have very little 'administrative' commitment. There is no responsibility for any library operation and no departmental collections. Worth emphasizing is the absence of any routine involvement with cataloguing and classification. There is freedom to undertake research but to the detriment of day to day term-time services. The school librarians are of course expected to remain in touch with developments in their subject fields and librarianship itself, but they are not 'scholar librarians'. New appointees are expected to have a good degree in a relevant subject, a professional qualification plus appropriate experience.

Library usage and needs in the social sciences

Humanities and Social Sciences (HSS) is the largest school comprising some 400 undergraduates, 70 postgraduates and research officers and 48 academic staff. There is a varied research programme. HSS is a heavy library user, accounting for 30 per cent of the total bookstock but more like 33 per cent of all issues; a quarter of all inter-library loan requests; and at least one third of all books bought. As the first full-time librarian serving the school I was able on appointment in January 1976 to take whatever initiatives seemed necessary.

It rapidly became apparent that many of the teaching staff were perplexed by the apparent inability of students to obtain reading matter for essays and seminars. Personal copies were widely lent. Undergraduates soon conveyed their chief problem, the unreliable provision of reading list references. The situation was exacerbated by considerable theft and illegal borrowing (in all subjects) while a better security system was under consideration. The following account briefly illustrates the chief methods by which a sounder undergraduate collection in the Social Sciences was developed thereby forming a base for research and information services.

Undergraduate book provision

The need for improvement meant little attention could be paid to differentiating between the needs of first years and finalists, to checking journal references or postgraduate courses. Modest duplication of key texts cited on lists began immediately, the 1976–7 funds allowing £1000 to be spent on extra social work and social policy material.

A reading list of varying length and accuracy is compiled for each of the 130 courses and options open to HSS undergraduates. By early 1977 most lists had been checked against the catalogue and shelves, the process being speeded by the secondment of a library assistant.for 1–2 hours each day. Assessing the collection in this manner was painfully slow but did produce an excellent idea of its merits from the user view. However the extent of stock building and duplication that was obviously needed, allied to early consumption of the bookfund, meant 1977–8 would be a crucial year. In addition security difficulties had led to mushroom growth in use of the closed access short loan collection, generating 27,500 issues in 1976–7 out of a total of 117,000, a 35 per cent increase over the previous year.

Fortunately 1977–8 saw major improvements which allowed the library in general and the Social Sciences in particular to make good progress. First the total library bookfund was increased from £40,000 to £94,000, the HSS share rising from £9,000 to £27,500. Secondly October 1977 saw the introduction of a continously manned exit check to restore security. To prove the latter's need sample stock checks in the Social Sciences had shown in term-time 111 or 34 per cent from 326 texts cited in 15 reading lists were missing; only 22 of the key journals used in the school had complete current issues.

The trebled bookfund was comfortably spent, including some £8,400 on extra copies of popular texts most of which were placed on 7-day loan. This pattern has continued for 1978–9 and 1979–80, whereby the school librarian has committed about 30 per cent of the yearly total on duplicates selected almost entirely from reading lists and frequently, in the early days, without consultation. The need for these acquisitions is now steadily receding. Circumstances at the time dictated such action and funds remained available to meet almost all usual school requests. Staff and students had indeed repeatedly urged the desirability of such duplication of essential reading.

More attention was given to increasing the effectiveness of duplication. Most significantly effort was concentrated on first year courses because of the large numbers involved, the dominance of set texts and the wish to give new students a good start. According to Shaw[4] 'Heavy duplication at this early level might therefore encourage the habit of library use. The early stages of a course are in any case those which usually require the most duplication, as most courses require more individual work in the second and third years.' Taken more into account were the numbers of students affected by each list; whether the subject was compulsory; if the course overlapped with others inside or outside the school; the level of diligence with which students followed up set reading (often related to the status of the lecturer or the weighting of the essay.) Lists were discussed with lecturers to gauge the relative importance of references, especially where not indicated, and to elucidate any changes planned for the following year. Finally requests from school members were more closely scrutinized to see if the number of copies and loan categorization were appropriate to meet likely demand.

What has been the impact of this considerable investment? Lending of books by lecturers and the number of complaints about the collection have been drastically reduced. More objectively there has been a massive increase in undergraduate loans from 62,524 in 1976–7 to 118,689 in 1979–80. It would appear that in the Social Sciences at least book provision is now just adequate for most students for most of the year. Recurrent problems to be faced are inherent in the school structure and teaching methods, ie the dominance of assessed work causing last minute rushes for recommended texts; the popularity of some essay topics; the large numbers on some courses, over 100. These peaks may be worsened by the absence of a user loan limit and data is being collected to establish the extent of overborrowing. Future prospects are not only to cater for this demand as economically as possible but also to encourage more book ordering from some staff. Selection of background material, filling gaps and checking reading lists will continue for the school librarian.

Short loan collection

Any library with a variable loan policy based on demand for the item rather than user status has a heavy responsibility to ensure texts are correctly categorized.

TABLE 1. *Trends in stock usage at Bath University Library*

	Total Loans	U-Grad Loans*	U-Grad Loans as % Total Loans*	7-Day Loans	7-Day Loans as % Total Loans	Short Loans	Short Loans as % Total Loans	Approx. No. of Books in SLC	Approx. % Short Loans from Social Sciences
	a	b		c		d			
1976–7	117172	62524	53.4	28618	24.4	24497	20.9	2000	60
1977–8	147013	76045	51.7	41061	27.9	37597	25.6	3400	50
1978–9	163265	101719	62.3	61225	37.5	24446	15	2000	40
1979–80	197152	118689	60.2	62704	31.8	13346	6.8	800	30

* Excludes SLC Issues

A marked feature is the phenomenal activity generated by the Short Loan Collection (SLC) in 1977–78 when some 3.9 per cent of total stock produced a quarter of all loans. Yet the SLC was faced with breakdown. It had reached its physical limits and no more circulation staff were available to cope with queues. The manual issue system just worked but reservations were often missed or muddled. Peak queues at the start of the 3 issue periods were taking 45 minutes to clear. Much of the material was either inappropriate or impossible to read in the given time. At least half of all issues were to HSS students but perhaps most unsatisfactory was the increasing tendency to enquire at the SLC in preference to checking the main collection. On the other hand the absence of security or adequate funding did allow the SLC to give a good measure of control over valuable items while meeting much demand with small outlay.

Vacation revisions in 1976 and 1977 kept the SLC under reasonable control, many unused or under-used items being returned to the open shelves. It was not until the arrival of many extra copies that a really substantial cut could be implemented in July 1978 when some 1400 Social Science texts were removed. 1978–9 saw the elimination of the 13.00 to 17.00 hours loan period, users begin given a longer day or overnight loan. Issues have fallen dramatically from 37597 in 1977–8 to 13346 in 1979–80 fully justifying the effort involved in pruning. In the majority of cases items removed from short loan were simultaneously duplicated, or duplicated in advance, to preserve and improve the level of availability. Nevertheless annual review and close scrutiny of initial loan categorization is essential to minimize growth.

7-day loans

The reduction of the SLC to near its final size was followed by a revision of 7-day loan texts in the Arts and Social Sciences, probably the first serious attempt since inception in 1966. Clearly this was long overdue for at the end of 1978–9 37.5 per cent of the year's issues were 7-day loans, 17 per cent of the total stock being so categorized, while 38 per cent of all 7-day books had not been issued once and 'A particularly important feature of a variable loan and duplication policy is that it presupposes repeated monitoring at intervals to ensure that the items made subject to a shorter loan period are in fact the most popular ones.'[5] About 6000 items were transferred to 4-week loan after examination of issue patterns. A major benefit has been the elimination of unnecessary fines and overdues. SWALCAP issue data is becoming more useful in the context of stock control. Analysis of usage by school, borrower status, class number, average length of loans, etc. is now providing important information.

Postgraduate and research needs

Less attention so far has been paid to researchers and postgraduates but the advent of 3 new taught masters degrees and an expansion in research staff is making a significant impact on the school. Even undergraduates 'research' as such for compulsory dissertations. The direct needs of postgraduates on taught courses are reasonably met since their reading lists have been extensively checked. Meeting the highly diffuse and unpredictable demands of full time researchers is another matter, common to all academic libraries: 'The problem of research provision is as difficult as it was a hundred years ago: how to provide within a reasonable budget for the unforeseeable needs of those carrying out research in many and widely differing fields. Even the largest and oldest university libraries are not self-sufficient in meeting all the needs of their users.'[6]

Selection of research material carries on by scanning the usual commercial and official sources as well as inter-library loan requests. Support is also achieved through the major abstracting and indexing tools. Their functions are described in detailed subject guides covering economics, sociology and development studies. A recent innovation has been the growth of Lockheed Dialog searches for staff and researchers, so far without charge.

It may be argued that a university library of 150,000 volumes is incapable of supporting seriously any research (and barely teaching). Tucker's[7] experience at Warwick indicates the smaller new libraries *can* successfully establish research collections through strict specialization allied to a flow of external money or material acquired by gift or deposit. Bath is favoured by a narrow range of taught subjects, reasonable undergraduate numbers, fully centralised collection and finances, and easy stock control. Improvement to the undergraduate Social Science collection may allow a small degree of future specialization. The essential prerequisite is to establish in consultation with the school the most secure and viable long term research activities.

Relations with the school

Close liaison has clearly been aided by the school's proximity while restricted a little by its lack of social facilities. Daily contact is essential to prevent remoteness, while participation in the odd school social or sporting event is almost equally useful. The school administration have been a perpetually helpful source of information and reading lists. School librarians have discretion as to the extent, if any, they wish to be school rather than library based. This again will depend on the relative importance given to staff information interests vis à vis an enquiry service.

General library policy may clash with school demands, eg opening hours, in which case the school librarians must communicate the official reasoning. If in sympathy with the school he may push for change via senior staff meetings and/or ameliorate the effect on school activities. It is partly for these reasons that attendance is so vital on Boards of Studies. Another possibility is the growth of too much influence with the subject librarian: book ordering may diminish, or he may receive routine enquiries meant for other sections. Relations with schools are inevitably most influenced by the personality of those involved and the extent to which academics are confident their needs are advanced. Good subject qualifications are highly desirable, if not essential, but the outgoing nature of school librarian posts, dealing from a public position with a cross-section of the academic community and their urgent needs, would exclude by temperament some well qualified candidates.

Applicability of school librarian concept

Given suitable circumstances there is every reason to believe that a subject specialist School/Faculty/Departmental librarian structure can satisfactorily meet user need, particularly that of undergraduates. The following factors illustrate why such a structure has been applied successfully at Bath:

1. The compact campus and student population of 3600.
2. Containment of most academic activity in a tidy school structure.
3. The narrow range of degree subjects offered by most schools.
4. The small size of the library and absence of departmental collections.
5. The great need for collection building since inception in 1966.
6. A small, homogenous library staff, with few specialist professional posts, allowing painless creation of such a scheme.

Its chief strengths lie in the freedom and potential for academic liaison and collection development. The school has an intermediary to personalize the library service and solve problems. There is a continuous advancement of their subject collection by an interested professional ensuring a fair share of resources directed evenly to real needs: a librarian able to control stock by easy manipulation of loan and duplication policies. Moreover the librarian can utilize subject qualifications in building something of satisfying and permanent value. It remains to give a balanced view by showing the difficulties such a structure may face.

The main structural weakness is the academic activity outside schools and therefore outside the scope of school librarians. Included are the small but important Centres of Research, large numbers of short stay American undergraduates, and Open University summer schools. In the absence of a 'utility' librarian to deal with such groups they tend to receive only minimal attention. Looking inwards the autonomy enjoyed by school librarians does produce, as might be predicted, very variable views and priorities. This can cause confusion if subject policies are at variance with general rulings, eg display of journals, overnight loans. Senior library assistants may be placed in awkward situations. Reasonable consistency is produced by monthly senior staff meetings and although 'the tendency towards the establishment of a variety of individual library systems with an inbuilt tendency to become mutually less compatible as time goes on'[1] is present it has not gone beyond cenrtain essential differences in subject emphasis.

Fluctuating numbers and constant turnover of junior assistants has had several results. First invaluable personal assistance tends to be withdrawn in crises, leading to increased routine work. Although some degree of clerical work is inherent, and has so far remained relatively small, it is worth noting that Woodhead's[3] 1969 survey found the chief causes of dissatisfaction at UCL and Leeds were the amount of routine work required by specialists and lack of scope for use of subject knowledge. Second there is more need for 'quality control' of basic processing of new material, both books and journals.

The school librarians are not normally involved in cataloguing or classification unless particularly difficult texts appear or reclassification of areas is desirable. In ensuring consistency of subject treatment occasional differences of opinion with cataloguing staff naturally arise. It is here that subject knowledge and academic contacts are most beneficial in devising the best solutions. A real dilemma facing school librarians is their siting on each floor. In the absence of obvious public access to functional sections or an enquiries librarian trivial questions arrive which could be answered elsewhere. Less time may be left for subject enquiries, while uninterrupted concentration is impossible in term-time. Several colleagues have become office-bound by preference, probably to the deterrence of the more diffident user.

Perhaps the most important issue is that of career prospects. Economic stagnation and the dearth of new senior library posts have stubstantially reduced professional mobility. In addition subject librarians must inevitably consider that 'as they get older they will thus be typecast and shunted into a siding as far as career prospects are concerned . . . At present the career structure of library staff presents a picture of aspirational conflict between the assistant librarians in the role of the subject specialist, at least partially committed to scholarship, and the promotional considerations which suggest that he should develop his managerial competence and polish up his administrative techniques.'[1] The nature of Bath's scheme, based in a fully centralized system without sub-librarian posts, must require alternatives to assessment of managerial competence. Such an alternative has been supported by Durey[8] commenting on the publication of the Board of Directors of the Association of College and Research Libraries (USA) which firmly links promotion to a high level of professional performance in areas contributing to the educational needs of the institution such as: collection development, bibliographic organisation and control, and reference service. Evidence on levels of performance would be collected from the academic community and external professional colleagues. A regular systematic review such as this would hopefully enhance promotion prospects. In similar vein, and at the risk of being heretical, the incremental system seems unlikely to prevent the danger of a downward drift in dynamism or to offer inducement for outstanding work unless applied more flexibly. But these are deep waters indeed. . . .

Conclusion

Whatever the local emphasis or circumstances the permanence of some degree of subject specialization in academic libraries is established. Increasing standardization, mechanization and regionalization of processes has already led to fewer housekeeping routines. The result should be more subject exploitation, in part at least, merely to manage the increasing size and complexity of even small collections such as Bath. Demand for library services seems most unlikely to fall during the next 3–4 years. A worsening of staff-student ratios in higher education and the extent of continual assessment in courses is likely to increase dependency on libraries. It would be surprising to see significant change, in the aims at least, of most subject schemes.

The future of Bath's Social Science collection raises issues common to all academic libraries: reconciling research needs with limited funding and space; the degree and direction of any future specialization; examining the viability of 'self-renewal'; maintenance of maximum self-sufficiency; the best use of microforms and on-line services; further refinement of stock control. With a reasonably sound undergraduate collection the school librarian can turn his attention more confidently to these critical long-term issues.

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Letter to the editor

PHOTOCOPYING FROM PERIODICALS

The purpose of this letter is to draw the attention of your readers to the Code of Fair Practice recently published by the Periodicals Publishers Association.

The Rights and the Wrongs aren't difficult in Copyright. The trouble comes with the grey areas, the in-betweens which are so difficult to be certain about. Most people, and certainly most librarians, approve of the principle underlying British copyright law: yet they wish the Rights and Wrongs were more clearly defined and delineated. But can they be?

Take this case:

You are in charge of the library of a for-profit organization. One of your tasks is to file articles in subject files. You put an article about arrows into the 'Arrows' file and an article about bows into the 'Bows' file. But along comes an article about 'Bows and Arrows'. You make a copy, put the original into the 'Arrows' file and the copy in the 'Bows' file (or maybe vice versa). Have you done wrong? Have you infringed someone's copyright? Could be sued? Convicted? Fined?

Theoretically, you could be. In practice, you wouldn't be. Why? Because no one is going to take you to court, spending thousands of pounds to get damages of maybe 50p. No one in his right senses, anyway.

Yet not everyone likes living dangerously, ignoring rules and regulations that cannot be enforced. A lot of people simply will not do things that are 'verboten', and thank heaven for that. So everything that can be done to remove uncertainty from the 'grey areas' goes a long way towards that objective.

Naturally, a code published by the PPA can only bind its own members (a list is included). Non-members and foreign publishers are not bound by it. Nevertheless, if a person does something which under the terms of the Code, is considered legitimate, the chances of action being taken (let alone succeeding) in respect of what has been done must be considered remote in the extreme; so in practice—if not in theory—the Code clarifies what can legitimately be done, in the UK, with *any* periodical article.

This makes it an important document. It insists, throughout, that legitimate photocopying from periodicals is restricted to the making of *single* copies; multiple copying without a licence is always a breach of copyright. But making single copies is not, if they are made

(1) for perusal or study by an individual who has specifically requested them
(2) to replace an original which has been lost
(3) to file an article under a second or subsequent classification
(4) to save space (eg retain an article as a microform).

The Code also defines 'single copy', supplying clarification that has been sadly lacking in the past. It is a copy which—when made—was neither intentionally preceded nor intentionally followed by another copy (of the same matter). Thus a librarian who made copies to meet the following requests:

Mr A	Article No. 1
Mr B	Articles Nos. 2 and 3
Mr C	Articles Nos. 3 and 4

would be in the clear, since the fact that two copies were made of No. 3 was coincidental, not intentional. The librarian made in fact two single copies of that article.

Compare this with the case of a lecturer who advises his class to obtain copies of articles X, Y, and Z: the librarian realizes what's happening, collects the applications, and finally makes 20 copies of each article. This is multiple copying which is not sanctioned by the Code.

Copies of the Code (which also deals with out-of-print and failure-to-supply situations) can be obtained from the PPA who will also supply self-adhesive stickers which, attached to self-service copiers, will tell users that the Code is available for inspection.

Which leaves to be answered the question of what the Code will achieve. I think it will lead to more *legitimate* copies being made, and I am convinced that's a good thing. I know that there are people who don't agree: they believe that more copies made on copiers will mean fewer copies sold. I don't see it that way and to date no evidence has been produced (there have been several studies, all inconclusive).

The fact is that through the sixties and seventies (the decades of the 'copier revolution'), technical and professional periodicals have done extremely well. And that makes sense to me. Copying facilities lead to journals being *used*, lead to articles being *read*. Without copying facilities the chance of reading a paper was low—when you couldn't keep a copy, you often couldn't get a copy, or you could get one only with disproportionate effort; and by the time you got it you had forgotten why you asked for it in the first place.

Now the picture has changed: you can always get a copy, you can always keep a copy, you can always file a copy and read it when you *want* the information. In other words, legitimate copying permits the proper *use* of journals, which is something authors and publishers should welcome.

I didn't say that there aren't any grey areas left in Copyright: it's an intricate subject. But I believe the Code has done away with those most frequently encountered in connection with the copying of articles from periodicals.

Harry P. Cemach, FCA FMS MIMC
Chairman, Anbar Publications Ltd

NOTES

The address of the Periodicals Publishers Association is: PPA, Imperial House, 15–19 Kingsway, London WC2B 6UN. Tel: 01-836 9204.

Anbar are members of PPA and the writer serves on the PPA's Copyright Committee. Anbar are also members of Aslib.

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Referral centres and services: a review

by

RUTH FINER

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A National Information Policy for the United Kingdom

L. J. Anthony

Acting Director, Aslib

EVERY YEAR, Aslib, in common with other library and information organizations, plays host to a large number of overseas visitors, many of them from developing countries. They come to the United Kingdom for many reasons but mainly to improve their own knowledge and experience, to study British ideas and methods and to make some judgment of which of these may be relevant to their own particular environments.

One theme which crops up again and again is a request for information about British national policy relating to information and library activities; a question which, at present, can be answered only in part because, unlike many other Western European countries, there is no readily discernible British policy in this field nor has there been one for many years. As far as information is concerned the last attempt at a coherent policy ended with the abolition of the Department of Scientific and Industrial Research following the report of the Trend Committee on the reorganization of civil science in 1963.[1]

The overall responsibility vested in DSIR for the systematic exploitation of information in the UK was replaced in 1965 by a division of functions between the Office for Scientific and Technical Information (OSTI), responsible to the Secretary of State for Education and Science, and the Ministry of Technology which took over DSIR's functions in the field of technical information and liaison services for industry. OSTI under the influence of the Department of Education and Science, adopted as its primary purpose the stimulation of research in the information field, much of it with a strong academic bias, and was eventually absorbed in to the British Library as that library's Research and Development Department. The industrial functions of the Ministry of Technology were transferred in due course to the Department of Industry, including those relating to the Industrial Liaison Officer (ILO) service, which was, perhaps, one of the most successful examples of government involvement in information dissemination. Regrettably the ILO service came to an end with the publication of the report of the Bolton Committee on Small Firms[2] in 1971, although a number of ILO centres continued to operate independently, attached to universities or polytechnics in various localities.

With hindsight it could be argued that the dissolution of DSIR and the scattering of its various functions was a retrograde step, as was the decision to stop funding the ILO service. Following the original UK pattern, most Commonwealth countries had, between the wars, set up a Council for Scientific and Industrial Research and in most cases these organizations have played a vital part in formulating and administering the national information policy of the country. It is true that, in general, the focus of such organizations has been on scientific and technical information with an occasional

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foray into the social sciences but this was the area in which action was most urgently required and only in the last decade has there been a growing interest in other kinds of information for commercial, business and legal purposes.

In many countries the idea of a national policy for co-ordinating information resources has tended to be linked with that relating to the co-ordination of library services and many proposals for the creation of a national scientific and technical information service have suggested that such a service should be based on a central library or documentation centre.[3] UNESCO, for example, has encouraged the setting up of centres such as INSDOC which were expected to provide both information and documentation services in the scientific and technical field, and some writers[4] have regarded the development of a National Information Service (NATIS) as complementary to such international activities as UNISIST, with specialized centres for scientific and technical information being related to the UNISIST programme and other documentary, library and archive services belonging to a NATIS programme.

However useful this view may have been in the past, particularly in relation to developing countries, a national information policy which relates only to the information resources of documentation centres and libraries is totally inadequate for present needs in Western countries, yet still it colours a good deal of current thinking on the subject. Events during the last ten years, and particularly the rapid developments in information technology, have conspired to create a climate in which an overall and wide-ranging national policy covering all aspects of information provision has become a matter of some urgency. The need for action has already been recognized in such countries as France, Western Germany and the USA, each of which has initiated a whole series of developments designed to come to grips with the problem in the context of their own particular needs and aspirations.

The developments in the formulation of a national information policy which are now taking place in the United Kingdom can be traced back to the Dainton report[5] which appeared in 1969. Aslib, in its evidence to the Dainton Committee, had suggested that it would be desirable to plan the services and operations of a national library as an integral part of a planned national library and information policy and recommended the creation of a National Information and Library Authority, responsible for the oversight and co-ordination of all the nation's activities in the library and information field, with the National Library as a sub-unit of such an Authority. The Dainton Committee did, in fact, recommend the establishment of a National Libraries Authority but with functions limited to the operation and development of the existing national libraries, and so the British Library was born. The Committee failed to come to grips with the information issue but recommended that 'the Government should examine the feasibility of establishing machinery to provide it with advice on policy concerning the development and co-ordination of national information services—*whether they are based on libraries or not*—which are the direct or indirect responsibilities of government departments'. The one recognizable result of this recommendation was the creation of ICCSTI (Interdepartmental Co-ordinating Committee for Scientific and Technical Information), which offered a forum in which some co-ordination of the information policies of government departments could take place, particularly in relation to the United Kingdom's input into the Committee for Information and Documentation in Science & Technology of the EEC.

Aslib returned to the theme at its Annual Conference in 1977 which was concerned with information resources in the UK and their contribution to a national information system. A highlight of the conference was a description of the creation and operation of the National Commission on Libraries and Information Science in the United States[6] which introduced the concept of a rational, coherent network of integrated activity among information suppliers and information seekers, based not only on libraries (and not only on computers either) but assuming a logical and structured pattern of communication.

It was, perhaps, a little unfortunate that, in summing up the discussion at the conference, Dr Urquhart put forward a proposal for the establishment of a National Library Authority with responsibility only for all library services in the UK which were funded by the public purse. When the Aslib Council came to debate this proposal there was a general feeling that to consider only publicly funded library services was too limiting a concept in the context of a national information policy and the matter was not pursued.

Later in 1978 the House of Commons Expenditure Committee, in its eighth report,[7] recommended that 'the DES should set up a Committee to examine as a matter of urgency the whole relationship between the Department, national, public, university and other libraries, and the library advisory councils'. The interest of the Expenditure Committee arose from its study of selected parts of the government's white paper on their expenditure plans for the period 1978/9 to 1981/2, which included the contribution of central government to museums and libraries. The committee requested memoranda from DES, the Library Association and SCONUL, among others, and was concerned first at the recurring delays in publishing the white paper so that it was usually, 'too late to influence the budget making process in many of the larger public library authorities in England and Wales', and, secondly, at the lack of detailed information on library expenditure.

The Library Association in its statement on the Expenditure Committee's report, took the words 'other libraries' in the major recommendation to imply a concern with non-publicly funded library and information services, which they welcomed. Only the most optimistic reading of the report supports this view, yet the LA were sufficiently encouraged to suggest that the proposed committee should be independent of the DES and of the library advisory councils and should include representatives of the major library and information associations.

In the same year the Library Advisory Council (England) embarked upon a study of the future development of library services and appointed a Working Group charged: 'to undertake, as a preliminary to a wider examination of future library development, a study of the organizational and policy framework within which libraries of all kinds will be able to co-operate most efficiently and effectively in a co-ordinated library service: giving particular attention to the roles of central government institutions and the Library Advisory Council'. The report of the Working Group[8] was published in September 1979. The Group had set out to consider five aspects of the problem, namely:

(a) the changing objectives of libraries of different kinds and the interaction between them;

(b) the likely impact of technological developments on library and information services;
(c) the needs to make accessible an increasing wealth of books and information;
(d) constraints on public expenditure which in the foreseeable future would make it imperative to achieve the maximum return on investment in the provision of effective library and information services;
(e) the present lack of machinery for the national planning and co-ordination of library services and for the formulation of policy;

but the report was, in fact, concerned only with the last of these. It considered two possible solutions to the problem:

(a) the establishment of a quasi-autonomous body, similar to the national authority recommended in the Dainton report;
(b) the improvement of existing arrangements by combining responsibility for libraries and technical information within a single branch of DES and restructuring the membership of the LAC(E) to provide a wider representation of interests.

In its recommendations to DES the Working Group came down in favour of the second solution, at the same time recommending that DES should initiate 'regular discussions among government departments of their collective responsibilities in the library field in co-operation with ICCSTI'. The one big disadvantage of choosing the second solution was that both DES and LAC(E) have limited geographical authority so that any result arrived at in this way would not be applicable throughout the United Kingdom.

On 1 September 1979 the Office of Arts and Libraries was established, responsible to the Chancellor of the Duchy of Lancaster and Minister for the Arts. The main effect of this decision was to separate responsibility for national and public libraries from that for academic libraries which remained with DES.

Later in 1979 the Library Association issued a memorandum[9] in which it discussed the merits of existing bodies which might be expected to be candidates for the role of a central planning and co-ordinating body and, having rejected DES in its present form and the British Library as being unsuitable for various reasons, indicated a preference for a new agency within government, attached to a department of state without geographical restraints. Since suitable agencies of this kind are not too plentiful the memorandum fell back on the suggestion that, perhaps, after all, the Secretary of State for Education and Science in his (UK) capacity as Paymaster-General might be a suitable compromise although, as the memorandum mentions earlier, 'it is doubtful whether industrial libraries, for example, would be prepared to acknowledge his authority'.

Since the LA Consultative Committee which produced the memorandum was completely innocent of any industrial representative, it is, perhaps, surprising that the industrial library was mentioned at all. In this respect the memorandum is in line with most of the reports which preceded it where the emphasis is almost wholly on publicly funded libraries and the information services which they may or may not provide. In an effort to redress the balance, Aslib in its comments on the LAC(E) report suggested once again that discussions should be broadened to cover the desirability of establishing a central responsibility for information as a whole and that the future of libraries might be more usefully considered within the framework of a national information policy.

Although the obsession with publicly funded library services may have been a factor in the massive unconcern of successive governments with information policy, in another context the representatives of British governments have been actively engaged in developing information policy at the international level. The most striking example has been in Western Europe where the Commission of the European Communities[10] has embarked on a series of three-year plans to develop information services within the Community and are advised in this undertaking by the Committee for Information and Documentation in Science and Technology (CIDST) which has two representatives from each of the nine governments including the United Kingdom.

The Commission has not been particularly concerned with libraries, the aim being to develop a 'common market' in information based on good telecommunications facilities and a thriving information industry. It has encouraged the formation of a European Information Producers Association and has awarded grants for the creation and development of new information services, particularly non-bibliographical ones. It is concerned to ensure that the benefits of information technology are fully exploited in Europe and it is supporting proposals for systems which increase the availability and accessibility of documents by electronic means.

In June 1979 the Commission brought together a number of representatives of the Information industry to discuss, among other things the critical factors which might provide opportunities for or inhibit further development of a European information industry.[11] It was recognised that one of the important factors hampering development of a coherent Community approach to the information problem was the enormous variation which exists between the information policies of the nine countries, particularly in the areas of legislation and fiscal policy as they affect information flow.

The Commission, of course, has as one of its stated objectives the co-ordination of national information policies, where these exist. The Commission's powers to change national legislation are limited but it does have considerable influence with national governments and it is hardly a practical proposition for any EEC country to develop a national information policy in isolation and without regard to the policies which the Commission is trying to pursue.

This became apparent when, early in 1980, the House of Commons Committee on Education, Science and Arts began their inquiry into information storage and retrieval in the British Library. During the course of their investigation the Committee visited Brussels and Luxembourg to acquaint themselves with current EEC thinking in this field and the report of the Committee refers frequently to the Commission's work.

The Committee received both written and oral evidence from Aslib, the British Library, the Institute of Information Scientists, the Library Association, the Office of Arts and Libraries, and SCONUL, and written evidence only from the national libraries of Scotland and Wales. Although ostensibly set up to look at the activities of the British Library, the enquiry rapidly developed into a much broader investigation of past, present and future methods of information exchange and dissemination, with particular reference to the impact of new technologies.

A considerable body of the evidence presented to the Committee argued that cooperation is not enough, but that there was a need for the formation of a national body to formulate policy and to co-ordinate UK library and information services. Aslib's evidence was particularly concerned with the need for a national policy relating to information provision and supply, which would bring together the three separate threads of information technology, information resources and the applications of technology, and libraries. The Library Association suggested the setting up of a body to co-ordinate library and information services, and SCONUL proposed a model for a national council on information and library sources. In supplementary evidence presented after the hearings, Aslib enumerated specific issues which would need to be considered in the context of a national information policy; the IIS and the Association of Database Producers drew attention to the needs of the information industry; and the Booksellers' Association, the Publishers' Association, the Society of Authors as well as the British Library took the opportunity to put their respective views on copyright.

At the Sheffield Tri-partite Conference in September 1980, the Minister for the Arts gave his reaction to the LAC(E) report on the future development of libraries[8]. He accepted that libraries and information services should be regarded as a single area of concern when future policy was being discussed and suggested the possibility of transferring to the Office of Arts and Libraries the responsibility for ICCSTI. He did not accept the need for restructuring the membership of LAC(E) to include representation of particular interests, e.g. industry, but was willing to discuss the possibility of setting up a library advisory council for the whole of the UK.

At the end of September a meeting was held between representatives of OAL, Aslib, IIS, LA and SCONUL to discuss the Minister's reply. The OAL representatives said that the need for government to adopt a more vigorously encouraging attitude towards library and information services had been accepted and OAL was considered to be a suitable body to take a lead in this, although there was *no question of OAL taking over the role of other departments.* OAL would hold further meetings with other bodies concerned with the provision of library and information services and with local authority associations.

The Aslib and IIS representatives stressed the need for considering the future of libraries as part of a wider information network and suggested that the forthcoming report of the Education, Science and Arts Committee should be studied before taking further action. The Library Association suggested the need for an Information Resources Council which might have a wider role than the present LAC(E) but this suggestion was not accepted. It was agreed that the associations should jointly organise a seminar in the Spring of 1981, in which OAL offered to take part, to consider national library and information policy.

The meeting also considered the relevance of the recently published report on Information Technology of the Advisory Council for Applied Research and Development.[12] This report was concerned with the new ways of manipulating and presenting information which are offered by developments in computing and telecommunications, with particular reference to the effects on printing, publishing, education, research and development. It discussed standards, copyright, data protection and other legal constraints and suggested that the responsibility for the regulation of communications and broadcasts should be exercised by a single government department. The major recommendations of the report was that one Minister should be responsible for co-ordination of government policy and action on the promotion and development of information technology ***and its applications.***

In this area, at least, the government responded swiftly, possibly because the groundwork had already been laid in the Department of Industry. A new Minister of State for Information Technology was appointed at the end of October with responsibility for the activities of the Information Technology Division of the Department of Industry, which will now be the focal point for developments in this field.

Earlier in October the fourth report of the House of Commons Committee on Education, Science and Arts was published.[13] It contained, among others, the following recommendations:[14]

(a) as soon as possible the Government should appoint a Minister of Cabinet rank to take responsibility for information policy and should provide him with the necessary staff, as far as possible by appropriate secondments from within Whitehall departments;

(b) the Government should set up as a matter of urgency a Standing Commission representative of the wide range of interests concerned with the provision of information, particularly by telematic means, to examine on a continuing basis the problems of developing a national information network, to formulate national requirements, to relate them to international developments, to investigate possible solutions, and to make proposals for their implementation by appropriate bodies.

The reaction of the library and information organisations has been to welcome both recommendations and to hope that they will be implemented as soon as possible. However government reaction is unlikely to be as swift as in the case of the ACARD report, for good reasons. Before either recommendation can be implemented some clarification is needed on a number of points including the following:

(a) What exactly is a national information policy and what activities should it be concerned with?
(b) How does it relate to the national policy on information technology?
(c) What should be the role of libraries in the implementation of such a policy?
(d) What are the international implications?
(e) What mechanisms are needed to ensure that the requirements of the users of information are given full consideration?
(f) Where in the government hierarchy should the focal point be placed?

The government will be seeking guidance on all these points and there would seem to be some merit in setting up the Standing Commission before appointing the Minister in order to have available a suitable mechanism for resolving some of these questions. There is now enough experience of developments in other countries to put together the bones of an information policy which will include such obvious issues as the role of government in the creation and dissemination of information; the legal and economic implications of universal access; government encouragement of the use of technology in information transfer systems; the concept of 'public good' and its effect on the economics of information provision; privacy and security of information; and the role of government in encouraging the provision of an adequate supply of skilled manpower for the information age.

What is not so clear is the role of libraries in such an information policy. The problem is that libraries have multiple functions: they relate in some way or other to three distinct areas of human activity, namely education, culture & recreation, and information supply. Whereas in special libraries the information function may predominate, in academic libraries the emphasis is on the educational role. Public libraries, at any rate in theory, are expected to fulfill all three roles to some extent and this is true also of the national libraries. This is another way of saying that the objectives of each kind of library are different which is perhaps why there is not just one library and information organization in the United Kingdom!

Function is closely related to funding on the principle that he who pays the piper calls the tune. If university libraries are funded mainly in order to provide educational support for a teaching activity within the university they can hardly be expected to use their limited funds to provide information and cultural services to the local community. The same kind of restrictions apply to special libraries in industry, institutions and elsewhere. The public library system is faced with particular difficulties. Not only has it begun to show some uncertainty about what its function and role in the community should be, but its funding is very much dependent on local political and financial variations. Confronted by a central government set-up in which funding for education, culture and the arts, and (hopefully) information services is provided by three quite separate departments, it is hardly surprising that the Library Association, which is the major body concerned with public libraries, finds some difficulty in deciding in which basket to put its eggs. There is, of course, no *a priori* reason why public libraries (or any other kind of library for that matter) could not receive funds from quite different sources for each of its functions, although there could well be some practical difficulties.

Alternatively it would not be impossible to arrange for one government agency to be responsible for funding all three areas of activity. When giving evidence to the Education, Science and Arts Committee, Mr Norman St John-Stevas agreed that, although he was not the lead minister on information matters—there was not one—he was, perhaps, a possible choice for that role if the need arose. Some people may feel that there is a touch of incongruity in a situation which puts the responsibility for a white-hot technological revolution in information handling into the hands of a government department with major responsibility for the arts. However, names can be changed: the real problem is that education, culture and information transfer are activities with somewhat different objectives although they may have a superficial resemblance and could make uneasy bedfellows in any government restructuring. In any case there are cogent arguments against having one source of funding for such a wide range of intellectual activities since funding leads to control and the dangers of this are obvious.

There are also geographical problems. Whereas it may be appropriate in the educational field to organise responsibility on a regional basis this would scarcely be possible in the information field since information must flow freely across regional frontiers. Whoever is responsible for the national information policy must be able to speak on behalf of the nation as a whole and be able to cross both regional and local government boundaries if an effective national information network is to be created.

This seems to imply some centralized funding of regional and local activities which are deemed to be important enough to make them independent of the variations in resources of local authorities. It can be argued, of course, that such centralised funding is itself subject to instability and can change with each change of government and there is certainly plenty of evidence to substantiate this view. It can also be argued that this is precisely why a national information policy is necessary so that each step which is taken is seen to be part of a coherent design with firmly stated aims and objectives and not just another *ad hoc* measure, taken in isolation to meet a particular need, and therefore subject to rescission by the next administration.

The pre-occupation with information as an all-embracing phenomenon in society is a comparatively recent development whereas libraries have a long and honourable history. Nevertheless the possibility has to be considered that too much emphasis may be placed in the present discussions on the role of libraries in the information chain. Naturally such a statement will be hotly disputed but many pointers to the shape of things to come lend support to this thesis. In the information context libraries are essentially delay lines in the communication of information between orginator and user, necessary because of the temporal gap between creation and use. So long as libraries were the only available mechanisms to fill this role their continued existence as sources of information was secure. However, this is no longer the case. Modern technology is offering alternatives which may well turn out to be more effective and cheaper. Admittedly there is some way to go before these electronic alternatives begin to fit comfortably into the norms of human behaviour but this is only a question of time.

On the other hand, information in its raw state is a very indigestible commodity. The words that issue forth from an online terminal are rarely themselves, answers to problems, which is what most people are seeking. The assumption that researchers and decision makers are eagerly awaiting the arrival of bigger and better systems to enable them to access ever greater quantities of information is hardly consistent with experience. In fact, such a development does nothing for these individuals except increase their anxiety.

What the 'user' really requires are relevant and immediately usable answers and this implies a need for a service which is able to collect, correlate, analyse and digest information and reproduce it in usable form. This is a task which the majority of special libraries already perform, else they would not be in the information business, and which other libraries could undertake if properly organized to do so. Many public libraries, for example, have the documentary resources to undertake the work of such information dissemination competitors as the small firms information bureaux or the consumer advice centres. What they do not have is the skilled manpower to exploit these resources so that they can provide not only information but answers. There would appear to be no over-riding impediment to prevent them acquiring such resources and in a rationally structured national information network they would appear to be obvious candidates for such tasks.

A national information policy for the development and exploitation of information as a national resource is unlikely to emerge overnight. Many problems remain to be discussed and many different points of view to be reconciled. Inevitably there will be a temptation to seek instant solutions for some of the simpler aspects of the problem before the main outline of the policy has been agreed. In formulating proposals the library and information organizations will need to ensure that the views of their members are fully represented and are given adequate consideration. We now have a unique opportunity to build a rational and more effective information handling structure in the United Kingdom; let us hope that we can make the most of it.

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Information users' changing expectations and needs

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Introduction

EVERY ORGANIZATION both within and outside industry in the public and private sectors exists because it provides a service or product that is either needed or wanted.

Continued success depends on the organization's ability to change its service or product to satisfy any changes in the basic requirements. Information Departments are no exception. They have customers with needs that are changing all the time. Understanding how these needs are changing is obviously an essential element when designing future services. The need to get the services right will be especially pertinent in a future when information is going to be increasingly viewed as an important resource that must be managed as effectively as the more conventional resources such as capital, labour, plant etc. This will inevitably result in closer scrutiny of the services we provide by those supplying the funds, so we must be sure that we are realizing our true potential, answering the needs of both the individual and the organization in a tangible way.

Two factors that will influence the users' expectations will be:

(1) the nature of the information need, and

(2) the impact of technology.

1. Information need

Information does not exist in a void, it is not in itself an end but only a means to an end, so the value and nature of the information required is determined by the pressures that originate the need.

When information science came to the fore in industry in the 1960's, the western industrialized world was experiencing political peace and economic prosperity. As the trade routes of the world expanded after the post-war protectionism, industrial output rose to meet the rapidly growing demand. At the front of this growth were the technology based industries such as petrochemicals, and reasonably enough it was this technology factor that seemed to be the key to success. Naturally industry demanded advances in the scientific and technical areas and an essential feature of this effort, namely the vital background information, spawned the arrival of scientific information sections. Information Departments consequently became firmly rooted

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in scientific information and were staffed by discipline orientated personnel of high subject competence.

However, in the late '60s and all through the '70s the business environment was changing. The economy worsened, technical progress was viewed more critically, and resources became scarcer and supply subject to political and economic motives. Although these business pressures were not essentially new, what was new was their intensity and common timing.

The consequences for information today are numerous.

(i) *Economics*—the cost of carrying out research and developing products has greatly increased so the value of information that can save unnecessary work and therefore reduce costs has increased. Information must be supplied quickly at the decision point.

(ii) *Technical information*—tighter markets mean that products must have distinct technological advantage, either to cut costs or in active product properties, if they are going to capture the market. At the same time technology is increasingly required to cope with new issues such as pollution, safety, efficacy and raw material flexibility.

(iii) *Wider based information*—the nature of the pressures acting on business are now so diverse that every time a product is developed, and even simply to maintain a successful product, more questions have to be answered. It is no longer simply enough to have a financially and a technically sound product.

e.g. we need to know—whether our raw material supply is guaranteed or do we develop alternatives/will alternatives affect our position in the market?
—are raw materials/products/processes safe and satisfactory under existing and future legislation?
—is labour supply sufficient?
—are we energy intensive?
—environmental consequences of the operation—is it satisfactory?
—consumer pressure on our product and marketing, do we understand it, what are future pressures likely to mean for the product—advertising substantiation, liability, labelling etc.

(iv) An important feature of many of the pressures is that their impact on the business can be almost immediate and the best reaction can only be effected if the signal is picked up early. This increases the emphasis on good *current awareness.*

(v) *Carefully organized information* is essential if the company is going to maximize potential benefit. Effective use of commercial statistics, research results, market data etc. requires extensive organization and retrieval. Legislation such as the various toxic chemical laws will require companies to store masses of safety testing data and that will require the use of sophisticated information handling techniques.

(vi) Information is clearly not now simply of technical importance. All parts of the organization can benefit and should be using all the available information. Furthermore, it is at the higher management level in the organization that this strategic information is needed and where, traditionally, information processing has not been particularly well done.

(vii) Information has to be tailored to its audiences. Senior managers for instance require briefings on key issues. It is no good supplying them with raw information, they need a detailed analysis so that they can assimilate the information quickly and react appropriately.

If the need for information has increased both in width and amount, one redeeming factor has been that information technology has moved forward dramatically at the same time, enabling us to reduce labour intensive functions and store and access ever increasing amounts of information. But just how will it impact on the user?

2. Technology

The impact of technology is ubiquitous in all walks of life. For instance the application of micro-electronics seems to be the order of the day; calculators, TVs, washing machines are just a few examples. It is probably true to say that the impact has been felt nowhere more than in the fields of computers and communication.

Computers have been employed in Information Science since the early 1960s. Initially they were used to produce indepth subject indexes and later for the interrogation of published data on machine readable tapes for machine SDI. In these instances the user received a better service in terms of enquiry turn around and, in the case of SDI, subject coverage. However in both cases the computers were essentially information tools and the technology had little impact on the user.

The advent of online bibliographic searching changed this in a dramatic way. The user was suddenly thrust into the front line, and was actively involved in the searching. Three main factors contributed to this change:

—developments in telecommunications;
—computer technology and especially time sharing;
—availability of machine readable tapes.

Online systems had a large impact on users because the subject coverage was very wide, the technology was very visible and, most important, they were actually involved in the whole process. Using the user's expert knowledge of the problem and the skill and source knowledge of the information specialist enabled the development of penetrating logic to disect large volumes of data. Immediate feedback allowed further profile and logic modifications to refine the search. The complexity of the various system languages and file structures almost preclude direct accessing of the data bases by the user unless he wishes to spend sufficient time familiarizing himself with the systems and their continuous developments. There are some developments that may make direct user access easier. The development of a common command language such as the one proposed for Euronet-Diane would make things easier but even then it can only be used as an aid and not a replacement for detailed knowledge of the various systems. Secondly, there are numerous technical ideas for automatic 'log on' procedures, command translation, interactive dialogues for profile construction etc. However, even if these developments are successful they will only be making access to the bases easier; they will not be substitutes for source knowledge and will certainly not allow for the subtleties of each base that are often unique and essential characteristics if the best results are to be obtained.

If the complexities of online searching preclude access by casual users the same cannot be said for viewdata. Viewdata has been specifically designed with the user in mind. Based on a simple tree logic system it enables the most inexperienced user to conduct a satisfactory search. The system is not designed for complex logic operations and can be likened to a filing system compared to the online document retrieval mechanisms. Given the right spread of document subjects there is no doubt that viewdata is very useful but its power is limited for very large document collections on closely related subjects. Its use in closed user groups with the added attraction that the users can input their own data will undoubtedly increase its application, and it will probably become an essential part of the 'work station' of the future.

One tangible outcome from the introduction of commercial online and viewdata systems has been the demand created for in-house equivalents. Speedy access to commercial data is of limited value if access to the important internal aspects takes much longer. Now that software packages are becoming increasingly available the growth of in-house systems will depend greatly on the availability of machine readable data and the cost of storage and retrieval. At the moment most machine readable data is purpose punched. There are already a number of interactive systems, such as STATUS, STAIRS, ASSASSIN and DECO which are being used to access computerized indexes and some specifically processed material. The floodgate will open when electronic data becomes the norm rather than the exception, and this will inevitably occur with the adoption of word processing as a replacement for existing typing services. These computer assisted typewriters are already making an impression producing data that can be readily processed and communicated to produce files that can be searched interactively. Whole text sequential searching or whole text inversion is at present very expensive in storage terms but probably more important than storage for the future, it also produces a high incidence of searching noise. To overcome this some form of text analysis must be carried out. Although there are machines that can analyze text they do lack the essential ability to convey the subtleties hidden in each document, something that can only be achieved by intellectual input. Manual indexing will, therefore, remain an essential part of document processing in the near and mid-term.

As mentioned above the problem of storage is unlikely to be a major one in the future. Figures given by Edwards of ICI at the 1978 Second On-line Information Meeting display the trend in storage costs for an 80,000 document set.

Online storage costs

Year	*Computer*	*Cost/year (£)*
1970	IBM 3330/1	7,200
1973	3330/11	5,600
1978	3850	≃200

Developments with bubble memories and video discs will probably mean that these trends will not only continue but will do so much more dramatically.

The advent of commercial online systems and viewdata and more recently their in-house equivalents will provide the basis for the office of the future where electronic data is stored, communicated, manipulated and retrieved at will. Realistically the development will probably take some time and will initially be task orientated. Typists will start with a word processor and add things such as viewdata according to the needs, whereas on the bench the emphasis will be on handling numeric data and manipulation and retrieval techniques.

The need for wide ranging information for all groups in the company and at all levels plus the impact of new technology will put heavy demands on Information Departments who will have to resolve how to use their resources most effectively, capitalizing on their information and communication skills to satisfactorily meet the challenge.

3. Users' expectations

The user is going to expect both a greater information flow and also more detailed intelligence in specific areas. How can this be achieved and what will the impact of the technology be?

Information Service Departments

Clearly Information Departments will have to provide information on a vast range of subjects such as legislation, science and technology, commerce, finance and social issues. To satisfy this type of demand the emphasis of the service will have to be placed on wide coverage rather than intensive subject involvement. Supplying 5 per cent of the operation with an exceptional service will not be acceptable if 95 per cent are left wanting. Also it will be very important to ensure that work done by the Information Department does not duplicate expertise elsewhere in the organization.

The library will obviously retain its important position at the centre of the information function, even though communications media may change from paper to microfilm or electronic data. The contribution from the librarian will be especially valuable because of his wide knowledge of sources. Technological impact on libraries will probably involve computers for cataloguing and general housekeeping such as purchasing, classification, loans etc., and the use of viewdata as an electronic reference shelf. One aspect of future library developments that is somewhat worrying is the concern over space and policies devoted to reducing the amount of paper in favour of microfiche etc. Paper is a very flexible medium and users like this particular property. It can be carried, read anywhere and be copied easily. Microfilm and electronic data do not share the flexibility of paper. Paper in the form of journals and books also has a visual appeal that should not be under-estimated as a valuable catalyst in the transfer of information.

If the technological impact on libraries so far has been slight, its effect on enquiry handling has been quite the opposite. Information Sections have always found that the users' capacity for asking questions has no limits. Resource has always determined what could or could not be done. As demand for safety data, commercial information, legislative data and technical information increased, there threatened to be a major failure to meet demand. Fortunately, technology, in the shape of online searching, has gone a long way to solve the problem, and it will continue to enable Information Departments to cope with expanding demand in the future. The steady expansion of database coverage from just technical to encompass most of the important areas will continue as more machine readable information becomes available. Online has enabled Information Sections to provide information when it is wanted and has removed the need for enquiries to be formulated weeks before the information is required. Users can come back time and time again throughout their work programme, almost at a minute's notice, to tackle a new problem. The close involvement of the users in the searching process has increased their awareness about the system and has resulted in the user carrying out the actual investigation of the literature, reducing the information scientists involvement. This is in many ways the correct way to use this technology. The aim is to increase the flow of information. Some people question how long the information intermediary will be needed. Anyone who actively searches online data bases will know that they are complex animals, each system has a different language and each data base a different structure. It makes searching by anything but an expert expensive and ineffective. The majority of users appreciate this and do not wish to do their own searching. In fact there is a strong argument that the diversity of data bases requires a specialist approach from the information section; if good quality searching is to be maintained. Whilst common use data bases should be familiar ground to all the information staff others require a more detailed knowledge of their specific structure and are best left to one expert. Without the required expertise valuable information in sensitive areas may be needlessly missed or misinterpreted.

We have stressed the importance of costs and economics and how they will play an increasing role in the information area. Online systems are expensive, and I think it is foolish to think that commercial pressures are going to keep their price down. One reason is that it won't be the spinners who dictate the price but the data compilers. As sales of hardcopy fall-off or the success of online outgrows hardcopy sales, the publishers will start to rearrange their cost structures and stop what has been tantamount to subsidy of online data bases. We have already experienced a reversal on the price spiral with increases in the price of a number of data bases. This will reinforce the need for specialist skills to access the systems. Output also needs to be controlled—too much will mean expensive printing, extra pressure on libraries to order, and extra time required for scrutiny. The information tool is incisive and should be used this way wherever possible.

Having said that searching will remain the preserve of online specialists I feel it important to emphasize that information personnel should not become neurotic about dominating the online access. After all we do not stop our users looking at the hardcopy *Chemical Abstracts* indexes. Some functions within the operation will be based on information and if they want to pay for their own access I feel it would be foolish to stop them. Our experience has shown that the difficulty is very apparent. They cannot get out what they think should be there and find it difficult to keep up with all the developments. Even in my case where I used online systems for several years, after a couple of years away I have found that developments occur at such a pace that I can only confidently maintain interaction on one base. The others I leave to the experts.

There is also a second point that should stop us getting over-concerned about this issue, namely that online systems are not the universal panacea that many seem to believe they are. They do provide us with an exceedingly powerful tool, but it is a tool that should be used when needed. There are many questions better answered from other sources—not online—and there are those that should be answered using hardcopy indexes and not their online equivalent. The information scientist's skill lies in knowing where the best source of information is—be it online, hardcopy, book, government department, trade association, fellow professionals or whatever; this will guarantee the success they want.

However, the power of new technology and its influence on information scientists and user alike must be watched carefully. The future success of Information Departments will entail careful management of the technology. Take online for instance. We are already experiencing an increase in the demand for 'online searches'. Users have stopped coming with 'enquiries' they now come for 'online searches'. The users' expectations of an Information Department must not be allowed to become restricted or blinkered in this way. Users must be educated to realize that information comes from many sources. Equally all new staff must receive a thorough grounding in all information sources and also in how to interrogate users about their enquiries.

In our discussion of the information users' need, one thing that was clear was that many of the pressures acting on business had an immediate impact. Examples of this are changes in legislation, market changes, raw material supply etc. etc. In these cases retrospective searching will often be less important than an efficient current awareness system. If the efficiencies of online retrospective searching cause staff levels to be reduced this labour intensive current awareness may be lost. The value of current awareness must not be underrated. It must be considered an essential part of the future information section's role. Whilst machine SDI can certainly provide assistance, especially in the scientific areas where currency is possibly not so important, there will be no substitute for effective manual searching in areas of applied technology, commercial information etc. Whereas deep subject knowledge will not be essential to answer enquiries there is an argument that in these latter areas effective current awareness can only be achieved with appreciation of the subject matter. The use of subject profiles to search data base updates is an alternative but in non-specific areas the use of a profile is no substitute for first hand examination of the source document.

Another area which will depend on having sufficient staff members will be in the maintenance of in-house systems. As we mentioned in the discussion about technology the introduction of commercial online and viewdata systems will inevitably lead to demands for in-house equivalents. This will mean that stored material will have to be manually indexed. Developments with in-house systems will involve both internally generated material and collated external data. Legislation such as the clearance procedures will require the storage and manipulation of masses of safety data. Information departments with experience with bibliographic data banks will be able to give valuable advice especially with regard to the problems of information structure and retrieval not appreciated by computer experts. In some cases the information departments may even have the competence to set up the total specification.

An important role Information Departments will fulfil will be that of system consultants' providing expert advice on the various systems available, both computerized and hardcopy, and which should be employed for the various private or corporate collections.

Hard on the heels of online systems will be the use of in-house viewdata. Whilst its role won't be the same as online it will provide numerous opportunities for displaying data—bulletins etc. The true potential of this system as a medium has yet to be truly recognized but it will be an important method of communication that could offer exciting possibilities.

The rapid development of communications technology needs to be watched carefully. It will probably prove essential to have someone with both user and computing knowledge to take care of systems development to ensure that the systems adopted are user-friendly and that they fit into what will be a totally integrated system in the future.

Subject specialisation

Whilst it is true that the need to increase the flow of information into the organization will result in loss of subject involvement there is still a need for subject specialists to provide the organization with enhanced information in a number of key areas. These specialists will cover specific areas of general concern to the organization and will not answer questions on the wide range of topics that the Information Departments generally handle. The main objective will be to provide the organization with an ongoing supply of valuable intelligence in the same way that consumer research, marketing and finance departments do.

Unlike the subjects specialists of old these will not duplicate expertise available in the organization. What they provide will be novel. There are a number of key features about these potential specialist areas:

1. Information is primarily available from documented sources.
2. Information is of long term value and interest.
3. Information is widely dispersed and requires extensive processing before its value can be appreciated.
4. No one function in the organization is responsible for providing a co-ordinated picture.
5. Information is required in an anticipatory rather than responsive mode.

Precise areas will vary from company to company but there are several which could be expected to be of common interest. Examples are:

- Raw materials
- Energy
- Product safety
- Occupational safety and hygiene
- Market developments
- Consumer legislation
- Packaging
- Distribution and retailing
- Technology monitoring

The overall object of the work is to establish a central point of knowledge within the concern that can be the source and target for information. The specialist will be required to:

- establish a central data bank of information
- examine new information to detect new trends

- provide state-of-the-art summaries and informed comment
- promote the exchange of information

The role requires the specialist to utilize both subject knowledge and information skills. Many of the important tasks will be achieved best by using traditional information techniques to acquire, organize and retrieve information. Indexes are invaluable in this regard and also offer opportunities to aid trend development analysis. Most functions will employ a current awareness function, utilizing bulletins etc.

By and large each operation will involve five basic features:

- Collection
- Collation
- Evaluation
- Analysis
- Communication

The type of output will depend on the nature of the subject. In some areas it will be the actual changes in status that are important so the current awareness function will be the most important, whereas in others the actual changes may be insignificant on their own and it's only when included with other changes and considered in the context of the total picture that the true implication can be detected. In these latter cases output tends to be discrete packages such as reports on the financial status of various economies or industries.

5. Summary

To summarize, information science is experiencing a number of important changes concerning both the needs of its users and the technology available for the provision of various services. The introduction of commercial online systems has increased access to a wide range of scientific and commercial data bases helping us to cope with increased user requirements. There are already many in-house equivalents providing the same quick access. Whilst it is conceivable and desirable that users will access the in-house systems as they will form part of a larger integrated electronic information system, it is unlikely, certainly in the mid-term, that they will have the time or the inclination to come to terms with the diverse file structures and system languages required to effectively search the commercial data bases.

Users will continue to expect information experts to deal with these enquiries using both online and other sources as needed. Where possible the users' expert knowledge must be utilized to interact with the searching and the raw bibliographic information, leaving time for information departments to offer satisfactory current awareness and system maintenance.

At the same time, there is a growing awareness of the opportunity and need for subject specialization directed in important areas that depend on documented sources. This should provide the organization with valuable intelligence and offer a rewarding job to information staff that have a commitment to subject involvement.

Finally, and possibly most important of all, the demand for information will be such that if the users in the organization do not think you have the ability to get it, they will get it from elsewhere. We must ensure that the users know what we can offer to meet their needs by actively seeking them out. It is essential that we market our services and emphasize what information there is, ways that information can be obtained, and also in some cases how it can be used. This is not the time to be reserved, we cannot afford to hide our lamps under any bushels.

UDC in the UK: a report on the 1979/1980 survey

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Technical Committee DOS/$_3$ UDC

Paper presented at an Aslib Evening Meeting, 19 November 1980

1. Introduction

I THINK THAT it would be sensible for me to begin this presentation with a declaration of my interest in the Universal Decimal Classification. I first became acquainted with the Classification over twenty-five years ago while I was a student at the Loughborough School of Librarianship. Subsequently I utilized the Classification in various technical college libraries and libraries and information services in the engineering and steel industries. Eventually I was responsible for the conception, development and implementation of a computer based integrated information handling system for the steel industry. I described this system, as it was at the time, in a paper I presented at the Fifth Cranfield International Conference on Mechanized Information Storage and Retrieval Systems in 1975.

I have never closed my mind to other approaches to indexing for retrieval and matching for dissemination. Indeed, I can well remember many what proved to be abortive experiments with various techniques. Once, my then colleagues in the steel industry and I ran a rather inefficient and somewhat inconclusive test comparing UDC notation and keywords as applied to the indexing of British patent specifications. The only record of this test will be found in the *Proceedings* of the International Symposium held at Herceg Novi, Yugoslavia, June 28—July 1, 1971. Nevertheless I have remained convinced that a multiple approach using the Universal Decimal Classification and other access points found in bibliographical records is by far the most effective way of retrieving or matching records of documents relevant to stated user requirements. A more detailed statement of some of my views concerning the UDC and related matters will be found in an article which appeared in *Aslib Proceedings* last year.

I have combined an active and practical interest in the UDC with membership of BSI Technical Committee DOS/3—Universal Decimal Classification (as it is now identified) and other relevant committees including for a period FID/CCC/M. Membership of these committees has broadened my understanding of the complicated national and international mechanisms necessary to the maintenance and development of the UDC besides reinforcing my conviction that the Classification is a necessary and very useful component of any effective information system.

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2. Need for a UDC survey

Clearly the management of a national edition of an international classification system calls for a great deal of information about the needs of those who apply it to informations systems and collections of documents as well as the needs of the people who use the systems and collections. With this in mind it may seem surprising to some that the management and development of the English language editions of the UDC have been largely based up to now on the collective experience and expertise of those librarians and information specialists who participate in the activities of DOS/3 and its numerous specialist sub-committees and the full-time members of the staff of the British Standards Institution who form the secretariat to those committees. Nevertheless, the members of British Standards Institution Technical Committee DOS/3 (formerly Sub-Committee OC/20/4) have been acutely aware for a number of years that even basic information is lacking. For example, we do not have an accurate and reasonably up to date list of users of the UDC in the United Kingdom, never mind any reasonably detailed information concerning the actual use of the Classification. While the management and development of the Universal Decimal Classification cannot be carried on without the support and hard work of all the individuals I have mentioned, their already significant contribution would be considerably enhanced if more factual information was available. I have previously declared my belief (in *UDC Survey UK 1979/1980 Report No. 1. The use of the UDC in Scotland*) that detailed information is essential to the planning of the development of the Classification in accordance with user needs. In addition, accurate records of user organizations are necessary to the profitable marketing of the schedules of the UDC and related documents. Also it is likely that the view held by some that the UDC is not suitable for use in modern progressive information activities is partially due to the lack of freely available adequate relevant information as well as to psychological blocks.

As I noted previously the members of BSI Technical Committee DOS/3 have been aware of the lack of relevant and useful information for some years. Thus, it came about that an attempt to gather some information concerning the needs of UDC users was initiated in 1973 by a decision of DOS/3. A detailed questionnaire was circulated to the members of DOS/3 and all its special Sub-Committees in December 1974. Some eighty-eight completed questionnaires were returned. An analysis of the answers was undertaken by Mr. J. E. Wright who was at that time Chairman of DOS/3. A report was issued as a BSI Private Circulation Document in March 1976.

Somewhat surprisingly only forty-six of the eighty-eight respondents declared their organizations as being users of the UDC. Twenty-five of the remaining forty-two respondents declared the use of schemes or methods other than Bliss, Dewey, Library of Congress and the UDC. Forty of the declared users of the UDC were satisfied that the Classification met their requirements. However, this must be coupled with the generally expressed view that more effort should be devoted to keeping the schedules up to date. A significant number of the respondents, thirty-three in all, were in favour of the traditional approach of disturbing the existing scheme as little as possible. A smaller number, then, were in favour of a comprehensive and systematic reallocation of concepts but nineteen were not.

The last two paragraphs of this report pinpointed two problem areas:

'It is a great pity that a list is not available in BSI of users in this country at least,

> and other English speaking countries too, and of the distribution of the various editions of BS 1000. A widely distributed questionnaire might go some way to providing the answer. From the answers received it is obvious that the paramount need of users and to some extent reflected in the answers from non-users, is for up to date revised editions of many parts of the schedules with machinery for the advice of extensions and amendments.'

This report by Mr. J. E. Wright gave considerable impetus to the revision and improvement of the English Full Edition of the UDC which was in progress at that time. However, this was not accompanied by any immediate effort to collect detailed information about British users of the Classification although members of DOS/3 pursued the matter in discussions during committee meetings. These discussions eventually culminated in DOS/3 agreeing that a survey of British users should be mounted. This was supported by the BSI secretariat and Hindson & Partners agreed to undertake the survey with no income other than that which might accrue from the sale of reports and associated documents.

3. Approach

Bearing in mind the dearth of information to which I have already referred, it will be appreciated that our approach to gathering information about the use of the UDC in the United Kingdom had to be basic and simple. After some consideration we came to the conclusion that it would be sensible to undertake a pilot investigation. Thus with the co-operation and assistance of John Bate of the Napier College of Science and Technology, Edinburgh, such an investigation was mounted. This involved the identification of users of the UDC throughout Scotland, the distribution of a one page questionnaire and the organization of a half-day seminar, which was held at Napier College. The major obstacle, if it can be called that, was the identification of users of the Universal Decimal Classification in Scotland. Fortunately it proved possible to extract the names and addresses of the majority of such users from *Library Resources in Scotland 1976—77*. One or two additional users became known via the seminar. This pilot investigation suggested that the distribution of a relatively simple one page questionnaire accompanied by an explanatory letter would be more likely to produce the greatest amount of useful information than the utilization of any other method.

It was hoped that organizations whose membership was likely to include a fair number of UDC users would co-operate in organizing meetings similar to that held in Scotland. In the event our initial approach to one or two organizations proved abortive so we abandoned that avenue of activity. Also we had hoped that a general appeal via the *Library Association Record* would prove helpful. Although the publication of the short note I wrote was delayed until July 1980 issue it produced little or no reaction except from a small number of people who had already returned completed questionnaires. This was most unfortunate as we had hoped that this appeal would generate a flow of contributions from users to whom we had not sent questionnaires. Although these users constitute a minority of the 'population' information provided by them would have been very useful and indeed would still be helpful.

UDC SURVEY
UK 1979 / 1980

N.B. Confidental information should not be given. Only quotable details please.

Name and address of responding organisation.

Names and titles of people involved.

U.D.C. application(s)

Examples and detailed descriptions additional to brief details given here would be welcome.

U.D.C. editions and fascicules used regularly.

U.D.C. editions and fascicules used occasionally.

Features of U.D.C. not used and reasons - briefly please !

Computers, terminals, word processing equipment used for U.D.C. applications (if none used please write None)

Your suggestions for the future development and improvement of the U.D.C.

SIGNED

NAME
(Block capitals please)

DATE

Please return to:
Richard Hindson
Hindson & Partners
Star House, 14 West Street
Bridport, Dorset DT6 3QP

In contrast to this experience I am glad to say that we had a more substantial response to our note in *ASLIB Information* June 1980 concerning the possible formation of a UDC Users Group, including a reply from Japan. Hopefully such a Group will be formed sometime in the future.

In the event, the outstandingly successful technique was the distribution by mail of a one page questionnaire accompanied by a short explanatory letter to organizations declaring themselves as users of the Universal Decimal Classification in the various guides to library resources compiled by the regional groups of the Reference, Special and Information Section of the Library Association. We sent out 493 questionnaires to these organizations in Scotland, South West England, London, the Home Counties and South East England.

4. Results

By February 1980 we were able to report to the British Standards Institution that we had identified 640 declared users of the Universal Decimal Classification out of a total of 2,895 libraries and information services in the United Kingdom excluding Northern Ireland, details of which were included in the above noted guides. As might be expected the greater number of users—360—are located in London, the Home Counties and South East England. Thus it is apparent that the use of the UDC is significant in the United Kingdom, as over one fifth, about 22 per cent in fact, of the 90 per cent or so of all British libraries and information services which are detailed in the records we examined declare themselves as being users of the Universal Decimal Classification. Indeed, examination of the records suggests that if public libraries, the principal users of the Dewey Classification are excluded, then the UDC is by far the most extensively used classification scheme in the United Kingdom. The use of other well known schemes, important as that use may be in certain circumstances, is really quite insignificant insofar as the numbers of libraries and information services using them are concerned.

We have received, up to now, 267 completed questionnaires which represents about 40 per cent of the probable total population and just over 54 per cent of those to whom the questionnaire was sent. We also received a few other replies. One library no longer had any staff and therefore it was felt that the questionnaire could not be completed satisfactorily. Another library had closed. Two had ceased using the UDC some time ago.

About one third of the completed questionnaires arose from libraries and information services serving industrial and commercial concerns. About forty came from libraries in the educational sector while thirty were completed by libraries operated by societies and institutions. Libraries and information services in nationalized industry, government departments including research establishments and hospitals together with national libraries and museums provided the remainder. We would of course welcome more completed questionnaires.

Now what did we find out about the use of the UDC itself? It became clear after we had received only a hundred or so completed questionnaires that the single most important UDC publication insofar as users are concerned is BS 1000A : *1961 Universal Decimal Classification : Abridged English Edition*. This has been confirmed by the remainder of the replies. Many users stated that a new revised edition of BS 1000A is required. In a way one is surprised by this as the pressure from users for revising and improving the UDC has been directed towards the many parts of the English Full Edition. However, we now know that a number of libraries and information services use BS 1000A by itself and many more use only a small number of fascicules in addition to this abridged English Edition. One can only assume that such users have not made their needs known either directly to the BSI staff or to the members of DOS/3.

It may be remarked that few users noted BS 1000C : *1963 Guide to the UDC*—less than ten. Whether this is a true indication or not of the use of this Guide has not been established. Only two or three users mentioned the later FID publication 574 *UDC - a brief introduction* by Geoffrey Robinson of the BSI, but once again this is not really evidence for any particular conclusion. It is perhaps interesting to note that no respondent mentioned the BSO—the Broad System of Ordering—which absorbed considerable FID effort during its conception and creation.

Although no part of the English Full Edition is as widely used as BS 1000A all parts of the Full Edition appear to be used by at least ten organizations as ten respondents to the questionnaire claim the maintenance of complete sets and the full use of those sets. All these users apply the UDC to what might be called large general collections. Often, however, these collections are so large that their various subject collections contain more specialist material than many a smaller specialist collection so their use of the full schedules is quite intensive.

In terms of the numbers of users of each fascicule it is possible to distinguish three ranges of use—

1—35 or more users
2—16—34 users
3—10—15 users

The overall pattern is shown in Table 1. It is interesting to note that those fascicules which are the most used are also the ones about which most complaints are made—53; 54; 55/59; 621.3 and 68/681.3. Apart from the apparent use of certain fascicules by those organizations which hold complete sets of the English Full Edition very little use is made of certain schedules. This includes 368—Insurance; 674—Timber and woodworking industry and 675—Leather industry, where only one or two additional users are recorded. However, we must be careful not to accord a low level value to such schedules. These additional users are often important specialist organizations whose experience is essential to the maintenance of the Classification.

While considerable use is made of UDC Auxiliaries and UDC Generalities this is easily surpassed by the use made of 65/651—657/659 and 68/681.3 both of which appear to be widely used both for subject classification and as a form of common sub-division. The use of both these fascicules exceeds that made of the other fascicules falling into the first level of use.

Insofar as the various relationship signs and ciphers are concerned we have not yet been able to reach any firm conclusions regarding their varying degrees of usefulness or even popularity. However, as one might expect, many UDC users ignore the relationship signs altogether; others utilize a small selection; yet others utilize a fairly

TABLE 1 *UDC survey 1979/1980*

Schedule	User code	Schedule	User code	Schedule	User code
Aux.	2	616	2	666	3
Gen 0	2	617	3	667	3
1	3	618	3	668	3
159.9	3	619	3	669	2
2	3	620	2	67/673	3
3/308	2	621/621.0	2	674	3
31	2	621.1	3	675	3
32	3	621.3	1	676	3
330	2	621.4	3	677	3
331	2	621.5	3	678/679	2
332	3	621.6	3	68/681.3	1
333	3	621.7	3	681.5	3
334	3	621.8	3	681.6	3
335	3	621.9	3	681.7	3
336	3	622	2	681.8/.9	3
337	3	623	3	682/683	3
338	2	624	2	684	3
339	3	625	3	685	3
35/354	2	626/627	3	686	3
355/359	3	628	3	687	3
36	3	629	3	688/689	3
368	3	631/632	2	69	2
37	3	633/635	2	7/7.0	3
38/382	3	636/639	2	71	3
383/389	3	64	3	72	3
39	3	65/651	1	73/76	3
5/50	3	+		77	3
51	2	657/659		78	3
52	3	654	3	79	3
53	1	655	3	8	3
54	1	656/656.7	2	9	2
55/59	1	656.8/656.9	3	9/1	3
6/60	3	66/66.09	2		
61/611	3	661	3		
612	2	662.1/.5	3		
613	3	662.6/.9	2		
614	2	663/664	3		
615	2	665	3		

User codes 1 = 35 or more users, 2 = 16 to 34 users, 3 = 10 to 15 users extensive range. Up to now no user has stated categorically 'we use them all'. It would be very interesting and useful to hear from any users who do. In any event, it is hoped that further analysis of the details already supplied will provide some useful data in this area.

It is interesting to note that, except for a very small number of organizations with specialist interests, other national editions of the UDC are not drawn on by respondents to the questionnaire. Quite why this should be so has not been established. Possibly users simply do not know of these other national editions or assume that official changes to the schedules arising from sources in other countries will eventually be incorporated in the English Full Edition. Also the FID annual *Extensions and corrections* are mentioned by only a few respondents and thus it is possible to assume that these too are rarely used.

The question about computers and so on was included in the questionnaire in the hope that some common ground with regard to computer based systems for handling 'UDC records' would emerge. However, in general, the respondents to the questionnaire indicated that such activities are not being undertaken or, for that matter, planned. In a way this is quite surprising given the apparent high level of interest in technological solutions to the problems of information handling. The approaches of the few respondents who do utilize computer based and similar systems are as diverse as the number of organizations involved. Hardware used includes an IBM 360, a DEC System 20, an ICL 450, a Tektronix word processor and the odd VDU.

Conclusions

The major conclusion that one can draw from this survey is that the Universal Decimal Classification, from a use point of view, is alive and well in the United Kingdom. In spite of all the well publicized faults of the UDC—which perhaps have been much overemphasized by some—and the difficulties stemming from the involved management and revision procedures users have not abandoned the Classification and there are few, if any, signs of mass desertions at present.

Work on the current revision of the English Full Edition is virtually complete. Under the new rule of the British Standards Institution each fascicule or part of the Full Edition must be examined at least once every five years and reapproved, revised or completely overhauled. Clearly it is now more important than ever that users participate in the revision process. However it would seem that many users are really not aware that they themselves can make a significant contribution to the improvement of the UDC. A considerable number of the 267 respondents have 'improved' parts of the schedules to suit current thinking and practice and their own special requirements. It is vital that users who have updated, revised and improved those parts of the schedules in which they have a special interest communicate details of their work to the Secretariat at the BSI. The availability of such details will be of great assistance to all concerned. It will also be very valuable in maintaining the British view of the UDC as against the views held at other national levels and the international level. It is a fact of life that these non-British influences can operate against the best interests of the UDC and the users, both at home and abroad, of the English Editions.

Another significant conclusion is that an updated version of BS 1000A : 1963 is urgently required. As you may know work is proceeding on a new BME—Basic Medium Edition—which in fact will replace BS 1000A. It is imperative, in my view, that the Schedule of this Edition is completed and published together with an extensive alphabetical subject index as soon as possible.

There is one point about which I would like to utter a word of caution. The pattern of use of the parts of the English Full Edition as indicated by this Survey does not really correlate with the sales figures recorded by the British Standards Institution. In any event it would be dangerous at the present time to make any far reaching recommendations concerning the current arrangements for producing and supplying the one hundred or so UDC publications made available by the BSI.

I must acknowledge my debt to the staff of the British Standards Institution and all those people who completed and returned our questionnaire. I have attempted in this paper to provide a useful and interesting, if brief, report on the UDC in the UK. It is hoped that we will be able to produce a more detailed document sometime in 1981. We are also in a position to produce a list of UK libraries and information services using the UDC if this can be organized on a commercial basis.

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A system for machine-aided thesaurus construction

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The BSI ROOT Thesaurus has been developed first of all as a comprehensive indexing and searching tool for technological applications and secondly as a labour-saving device in the construction of further thesauri. The classified section of the thesaurus was prepared first and input to the computer, where it is held in subject order, and from the subject file the alphabetical section was generated entirely automatically. In future thesaurus projects it will be possible to make use of the system developed and/or all or part of the existing subject schedules.

1. Introduction

MAKING A THESAURUS is a labour-intensive job. Quite apart from the need to check (with a specialist in the subject) the meaning of every term, there are the tasks of alphabetizing, allocating cross-references, copying out lists of related terms, endlessly proof-reading at successive stages of typing and so on. After the intellectual work of selecting terms and determining their inter-relationships there remains an enormous amount of clerical labour which is routine in character but must be carried out with unrelenting accuracy.

Making a thesaurus is also a permanent job. It does not stop when the first edition rolls off the presses. As soon as indexers start to use it they clamour for new terms to cope with advances in technology. There has therefore to be some provision for updating the thesaurus and printing subsequent editions incorporating all the amendments (which of course entails repeating much of the clerical work and corresponding proof-reading).

Making a thesaurus is, finally, a repetitive job, in the sense that a new thesaurus very often repeats substantial amounts of material already present in existing thesauri.

When work began at BSI/THE on a new thesaurus, the computer was seen at first as a means of reducing the clerical labour and associated proof-reading. In addition the machine would greatly aid future updating. A further advantage emerged subsequently: the machine-readable version could be adapted for use in other thesauri. If the schedules were properly structured, with versatility of output built into the system, then the basic files of this comprehensive thesaurus could be used to generate specialized thesauri on demand for a range of technological applications.

The BSI ROOT Thesaurus[1] therefore emerged as the basis from which a whole series of thesauri and related products could be obtained. For this purpose it would have to be comprehensive, with a modular structure to which additional sections could be added as required and existing sections expanded or modified.

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TABLE I: *Main subject areas included in ROOT*

A	General section	N	Mechanical engineering
B	Measurement, testing and instruments	O	Military technology
		P	Production engineering
C/E	Science	Q	Transport engineering
F	Medical sciences	R	Construction
G	Environmental and safety engineering	S	Mineral extraction technology
		T	Materials
H	Agriculture, forestry and fisheries	U	Metallurgy
I	Food technology and tobacco	V	Chemical technology
J	Energy technology	W	Wood, paper and textiles
K	Electrotechnology	X	Consumer goods and services
L	Communication	Y	Administrative science
M	Control and computer technology	Z	Social sciences and humanities

This article aims to describe the potential of ROOT for developing further thesauri, but first it must explain some of the background. In section 2 there is a general description of the thesaurus, as brief and concentrated as possible. In section 3 an account of the development of ROOT explains what was involved in its production, and why. Section 4 describes briefly the characteristics of the computer and programs used, and in section 5 there is a description of the development possibilities, including the production of a range of specialized thesauri.

2. The BSI ROOT Thesaurus: a brief description

2.1 Coverage

As can be seen from the list of section headings in Table I, the main branches of technology are covered in depth. Other fields, such as social sciences and administration, are included in less detail only to support the technological areas. The main sources of terms included in ROOT were Thesaurofacet[4] (and a variant of it previously developed by THE), the ISO thesaurus (first experimental edition)[7] and the list of terms used in the BSI library for indexing world standards. The thesaurus contains 11,800 descriptors and 5,500 lead-in entries at present; more entries will be added as it is updated to add more detail and keep pace with technology.

2.2 Presentation

ROOT is printed in two volumes: the Subject display and the Alphabetical list. The Alphabetical list shows the terms in conventional thesaurus format (i.e. with broader, narrower, related terms, etc.) and acts as an index to the Subject display, which presents the same terms in classified order, fully cross-referenced.

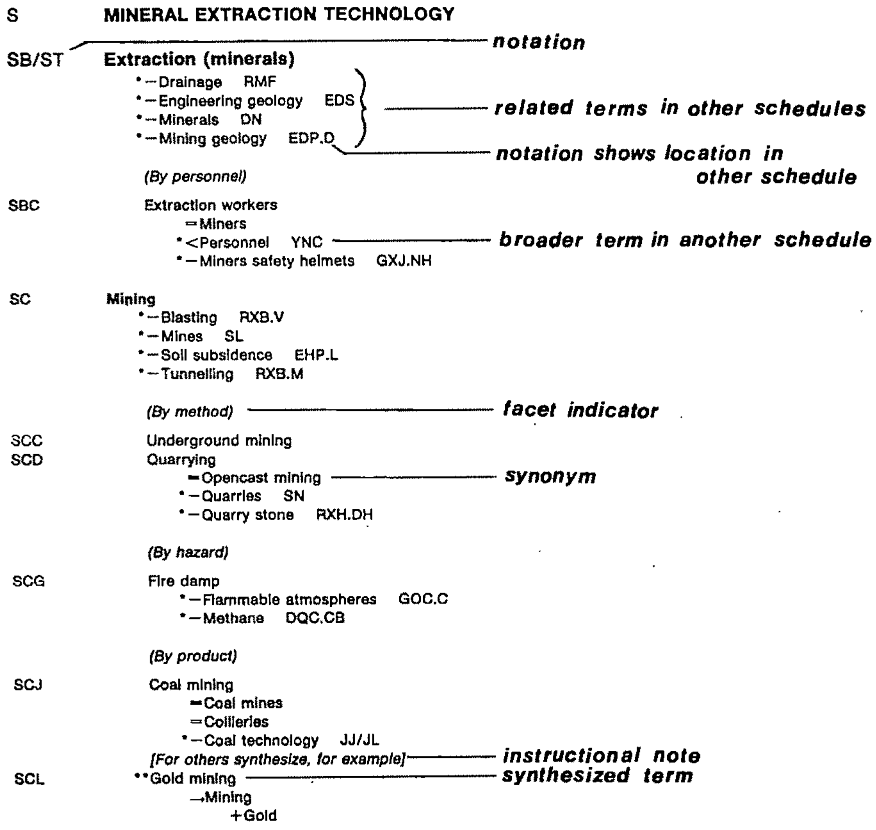
The Subject display was designed to be used in indexing and searching as the principal part of the thesaurus. It therefore shows all the data available, including related terms, scope notes and synonyms to descriptors. It also shows many entries of the following type:

[Synthesize, for example]
**Gas refrigerators
→Refrigerators
+Gas-powered devices

Instructions of this type, to synthesize a concept by combining two or more existing descriptors, are intended as examples of what to do in similar cases so that indexers and searchers will use the terms consistently. The use of synthesis is recommended also to avoid the inclusion of too many precoordinated terms.

The extract from Section S (Mineral extraction technology) of the Subject display, given in Fig. 1, illustrates several features, for instance how indentation and change of type style are used to indicate the hierarchical level of a given term. For an explanation of the symbols used, see Fig. 2.

In the Alphabetical list nearly all of the information in the Subject display is repeated, but with a change of format. The symbols shown in Fig. 2 are used instead of the abbreviations BT, NT etc., since the latter have the disadvantage of being specific to the English language. The use of linguistically neutral symbols is one of the features introduced to make ROOT suitable for multilingual applications. Fig. 3 shows some typical entries from the Alphabetical list, with the corresponding array in the Subject display.



S **MINERAL EXTRACTION TECHNOLOGY**

SB/ST **Extraction (minerals)**
•—Drainage RMF
•—Engineering geology EDS
•—Minerals DN
•—Mining geology EDP.D

(By personnel)

SBC Extraction workers
=Miners
•<Personnel YNC
•—Miners safety helmets GXJ.NH

SC **Mining**
•—Blasting RXB.V
•—Mines SL
•—Soil subsidence EHP.L
•—Tunnelling RXB.M

(By method)

SCC Underground mining
SCD Quarrying
=Opencast mining
•—Quarries SN
•—Quarry stone RXH.DH

(By hazard)

SCG Fire damp
•—Flammable atmospheres GOC.C
•—Methane DQC.CB

(By product)

SCJ Coal mining
=Coal mines
=Collieries
•—Coal technology JJ/JL
[For others synthesize, for example]
SCL ••Gold mining
→Mining
+Gold

notation
related terms in other schedules
notation shows location in other schedule
broader term in another schedule
facet indicator
synonym
instructional note
synthesized term

FIG 1. *Extract from the Subject display*

Symbol	Meaning
<	Broader term
>	Narrower term
—	Related term
•<	Broader term in an alternative hierarchy (polyhierarchical relationship)
•>	Narrower term in an alternative hierarchy (polyhierarchical relationship)
•—	Related term in an alternative array
=	Non-preferred synonym or quasi-synonym
→	Use. (The term or combination of terms following the arrow should be used instead of the term preceding it)
+	This symbol appears between terms which are used to synthesize a given concept
••	Synthesized term. (The term which follows the symbol is a non-descriptor which should be represented by a combination of terms, as indicated)
=••	The term (a non-descriptor) following the symbol may be represented by the combination of descriptors preceding it
[.....]	Scope note or instructional note. This clarifies the meaning of a term in the context of the thesaurus or gives guidance on the use of a term
(By .....)	Facet indicator. This is a device used in the subject display section to group together terms having a common characteristic

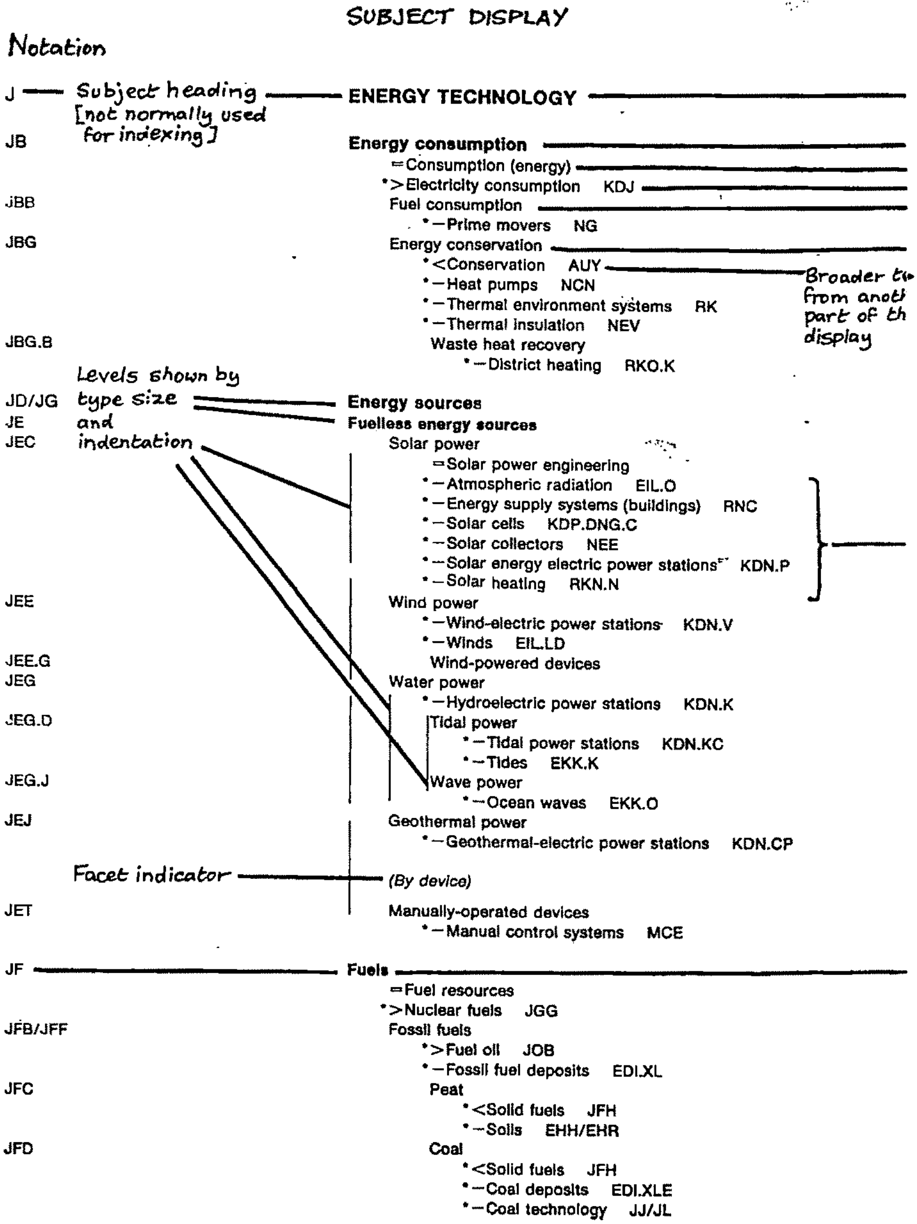
FIG 2. *Key to symbols*

3. The development stages in the production of ROOT

One of the most important design features of ROOT from the very beginning was that terms should be set out in a logical subject order. If the listing of descriptors is purely alphabetical the detection of synonyms and closely-related terms is a random affair. When the terms are fitted into a classified scheme, however, related terms are brought together and any gaps in coverage become apparent. (For further advantages of classification, see Ref. 2 pp. 78–9 and Ref. 3.) With the possibility in mind of later producing a series of thesauri adapted for special applications, it becomes all the more essential to have a Subject display that allows one to see at a glance the depth of coverage in each area.

Great attention was given to developing for the classified section a structure which would accommodate extra terms as and when required. With the computer facility for updating and producing variant thesauri, it becomes relatively less important to incorporate all the terms that may one day be required and more important to establish a sound framework with places into which new terms or whole sections may be slotted. Faceted classification was chosen as the most suitable technique for establishing such a framework. (In structure, ROOT owes much to the inspiration of Thesaurofacet[4] and the UNESCO thesaurus[6]; it has much in common also with the Thesaurus of Consumer Terms[5] and other thesauri using faceted classification.)

Work on the thesaurus therefore began with an outline of the broad subject areas required. (See Table I.) Facet analysis provided the detailed structure within each of


SUBJECT DISPLAY
Notation
Subject heading [not normally used for indexing]
Broader t
from anot
part of th
display
Levels shown by type size and indentation
Facet indicator

- J **ENERGY TECHNOLOGY**
- JB **Energy consumption**
  - =Consumption (energy)
  - •>Electricity consumption KDJ
  - JBB Fuel consumption
    - •—Prime movers NG
  - JBG Energy conservation
    - •<Conservation AUY
    - •—Heat pumps NCN
    - •—Thermal environment systems RK
    - •—Thermal insulation NEV
    - JBG.B Waste heat recovery
      - •—District heating RKO.K
- JD/JG **Energy sources**
- JE **Fuelless energy sources**
  - JEC Solar power
    - =Solar power engineering
    - •—Atmospheric radiation EIL.O
    - •—Energy supply systems (buildings) RNC
    - •—Solar cells KDP.DNG.C
    - •—Solar collectors NEE
    - •—Solar energy electric power stations KDN.P
    - •—Solar heating RKN.N
  - JEE Wind power
    - •—Wind-electric power stations KDN.V
    - •—Winds EIL.LD
    - JEE.G Wind-powered devices
  - JEG Water power
    - •—Hydroelectric power stations KDN.K
    - JEG.D Tidal power
      - •—Tidal power stations KDN.KC
      - •—Tides EKK.K
    - JEG.J Wave power
      - •—Ocean waves EKK.O
  - JEJ Geothermal power
    - •—Geothermal-electric power stations KDN.CP
  - *(By device)*
  - JET Manually-operated devices
    - •—Manual control systems MCE
- JF **Fuels**
  - =Fuel resources
  - •>Nuclear fuels JGG
  - JFB/JFF Fossil fuels
    - •>Fuel oil JOB
    - •—Fossil fuel deposits EDI.XL
    - JFC Peat
      - •<Solid fuels JFH
      - •—Soils EHH/EHR
    - JFD Coal
      - •<Solid fuels JFH
      - •—Coal deposits EDI.XLE
      - •—Coal technology JJ/JL

FIG 3. *Examples of the subject display and alphabetical list with explanatory notes*

CORRESPONDING ENTRIES FROM ALPHABETICAL LIST

ENERGY TECHNOLOGY J

Synonym

Energy consumption JB
= *Consumption (energy)*
> Fuel consumption
— Energy conservation
•> Electricity consumption KDJ

Narrower term from another part of the display

Narrower term of Energy consumption

Consumption (energy)
→ Energy consumption JB

Term related to Energy consumption

Electricity consumption KDJ
— Electric power systems
•< Energy consumption JB

lated terms from other
ations in the display
own by notation)

Fuel consumption JBB
< Energy consumption
•— Prime movers NG

Energy conservation JBG
> Waste heat recovery
— Energy consumption
•< Conservation AUY
•— Heat pumps NCN
•— Thermal environment systems RK
•— Thermal insulation NEV

Descriptor entry shown bold

Fuels JF — Notation
= *Fuel resources* — Synonym
< Energy sources — Broader term
> Automotive fuels
> Aviation fuels
> Fossil fuels
> Gaseous fuels
> Liquid fuels
> Solid fuels
(the six lines above) Narrower terms
— Change of fuels — Related term
•> Nuclear fuels JGG — Narrower term in another part of the display

To one level

these. Authoritative definitions were found for most of the descriptors. At this stage it was unnecessary to list the terms in alphabetical order, as it was planned that the computer should generate the complete alphabetical section. It was therefore necessary to incorporate in the classified section *all* the data including synonyms, scope notes, broader, narrower and related terms, etc. In other words the classified section was conceived as the authority file, from which the alphabetical section could be produced automatically.

The manuscript that was gradually developed looked very similar to the Subject display as it now appears in print, but with some additional data elements which are now held on the computer file but are not printed out in the standard version of the thesaurus. These data elements relate to the source of the terms and other housekeeping functions, some of which are not necessary for the production of the thesaurus. The fields they occupy on the file could be adapted for other functions in future applications of the thesaurus.

At this stage one other code had to be assigned to each descriptor: a code for its relationship to the term above it in the hierarchy. This is used by the computer in generating the entries for the Alphabetical list. Normally, if Descriptor A is indented under Descriptor B, then it must be a narrower term and the entries:

Descriptor A
<Descriptor B

and Descriptor B
>Descriptor A

will be generated automatically and merged with the rest of the data for the Alphabetical list. But if the relationship between the two is in fact associative and not generic, then a code is attached to Descriptor B which the computer interprets to produce entries:

Descriptor A
—Descriptor B

and Descriptor B
—Descriptor A

Fig. 3 shows a portion of the Subject display and some of the corresponding entries in the Alphabetical list. Some descriptors have relationships only with terms immediately above or below them in the hierarchy and for these the broader, narrower and related terms shown in the Alphabetical list have symbols <, > and – respectively. But some other descriptors have additional broader, narrower or related terms whose location is in another part of the Subject display and which are therefore shown as asterisked cross-references. The same symbols (*<, *> and *– respectively) are used to show these relationships in the Alphabetical list.

The thesaurus notation, illustrated in Figs. 1 and 3, is semi-hierarchical and was designed with hospitality to accommodate any descriptors required in the future. It was added to the manuscript as the final stage before keying into the computer for processing. The computer then identified and added the correct notation to each of the asterisked cross-references in the Subject display. The Alphabetical list was then generated and the whole thesaurus typeset by computer.

4. How ROOT is held on computer

The BSI ROOT file is held in machine-readable form so that it can be manipulated to produce a variety of products in diverse formats. A special suite of programs was written by our computer consultants Hutton & Rostron for the creation, processing and output of the database using PAL8 for a Digital PDP8e computer with 20K core store.

Unlike those machine-readable thesauri for which the principal file is held in alphabetical order, the ROOT database is held in the same order as the Subject display, as a series of numbered records each containing any number of lines. The first line in every record is a main or synthesized term, preceded by its notation. Subsequent lines in the record consist of notes, scope notes, synonyms, additional broader, narrower or related terms (all associated with the main or synthesized term) and facet indicators.

Once input of the data is complete, the programs are run to process the files and generate the Alphabetical list. (See Fig. 3 for some typical entries from the Alphabetical list, with corresponding Subject display.) For each descriptor, the scope notes, synonyms and asterisked cross-references are repeated just as they appear in the subject display. To show the main relationships (i.e. where terms are preceded by <, > or —) the computer must infer this information from the level of indentation and coding of the descriptor, as described in section 3 above.

The complete thesaurus can then either be computer typeset or simply printed out on any form of line-printer stationery.

5. Development of other thesaurus products

ROOT is the starting point for a range of developments, some of which are as follows:

(a) Multilingual thesauri
(b) Glossaries of terms with definitions
(c) Updated versions of ROOT
(d) Specialized thesauri based on selected schedules from ROOT augmented by extra detail in the specialist areas.

5.1 Multilingual thesauri

A French version of the thesaurus was prepared in parallel with the English and has influenced the final choice and arrangement of terms. The French version is currently available in the form of computer printout and, depending on demand, may later be published in full.

Translation into additional languages is greatly facilitated by the presentation of terms in subject order: whole groups of related terms can be translated together in context. The computer handles translated versions by holding them on separate files which can be merged to produce a variety of outputs in the format and combination of languages required. For example the full Subject display and Alphabetical list can be printed in other languages, the English Alphabetical list can be printed with foreign language equivalents or a parallel Subject display can be produced showing two language versions side by side.

5.2 Glossaries

Definitions for most of the terms in the thesaurus have been taken from British Standards, International Standards, specialist dictionaries and glossaries. It is proposed to put these definitions on a supporting computer file for the production of glossaries (mono- or bi-lingual) or cards to help users of the thesaurus in indexing.

5.3 Updating

ROOT will be continuously maintained by BSI staff and amendments issued systematically. Use of the computer greatly facilitates the production of amendment slips and eventually the publication of a new edition incorporating all the modifications.

5.4 Specialized thesauri

It will be apparent from the description so far that the versatility of the ROOT computer system means that variants of the thesaurus can be produced with very little effort. For instance, if a firm in the chemical industry wanted a thesaurus consisting only of Section D (Chemistry), Section V (Chemical technology) Section B (Measurement, testing and instruments) and Section A (General), then the computer could be instructed to generate the corresponding Alphabetical list and print out (or typeset) the complete chemical thesaurus consisting only of these four sections.

Many specialist applications, however, will require more than just a subset of the basic ROOT. The following are the main steps to be followed in generating a new thesaurus from ROOT.

(a) Look at the overall structure of ROOT. Discard those sections which are not relevant to the application in question. Select the sections which can be used as they stand (or with minor modifications) and identify any completely new subject fields which must be added.

(b) If any new subject fields are required, these must be developed following the sequence described in section 3 above. This will apply mainly to subsidiary areas since the main fields of science and technology are already covered in some detail.

(c) Those sections which can be used as they stand should be revised carefully and if any minor modifications are required these can easily be added to the existing computer file.

(d) For a specialized application, additional detail will probably be required in some sections. The systematic arrangement of the Subject display makes it easy to identify the places where new terms must be added.

The procedure is to collect the new terms and fit them into place in the structure, showing synonyms and scope notes wherever appropriate. Where a concept considered for inclusion is deemed unsuitable on the grounds that it should be represented by combining two existing descriptors, it can be incorporated as an example of synthesis.

Quasi-synonyms to existing descriptors, although shown as non-preferred terms in ROOT, may be given the status of full descriptors for the purposes of specialized applications. Similarly, terms which in ROOT would be synthesized using a combination of descriptors may in this context be precoordinated.

The next stage is to insert a code against each descriptor showing whether it is a narrower term or a related term of the descriptor immediately superordinate to it. This ensures that the corresponding entries generated for the Alphabetical list will show the correct relationship. Then cross-references to any broader, narrower or related terms in other schedules should be inserted. Finally the notation is added.

(e) The amendments resulting from (c) and (d) above, plus any new schedules from (b), are then keyed in and merged with whichever existing files are selected.

(f) The programs are run to process the file and generate the Alphabetical list. At this stage the complete file can be printed out by line-printer or used to generate a drive tape for computer typesetting.

In summary, the time and effort required to produce a new thesaurus are greatly reduced by this method. Where existing files are re-used, none of the material has to be copied out, rearranged or proof-read. Where extra detail is added, only these modifications to the file must be proof-read with care. No time need be lost on transferring data from a classified section to an alphabetical section, because the computer will do it automatically. The alphabetizing is similarly taken care of. The computer system does not, of course, replace the intellectual work of selecting and arranging the terms to be included.

For subject fields which are not central to ROOT (the pure sciences, for example, or the humanities) there may be little gain in using the existing files. It may be as well to start afresh with a new structure and change of emphasis. Still, however, the ROOT system may be used. In other words, the layout, the method of incorporating everything in the classified section and generating the alphabetical section from it, the suite of programs, could all be used quite independently of the subject matter in the thesaurus.

6. Conclusion

Although the first objective in constructing ROOT was to prepare a tool for indexing standards and technical regulations, it subsequently emerged as a multidisciplinary tool for more general application. It is also hoped that the ROOT computer system may help in many future thesaurus projects. The system itself can be used to reduce the clerical labour involved in thesaurus production, while adoption or adaptation of the existing files means a further substantial saving in time and money.

Acknowledgements

The successful outcome of the work described in this article was due in large measure to the guidance of Jean Aitchison and the patience and ingenuity of our computer consultants, Hutton & Rostron. Our thanks go also to the British Standards Institution staff who helped in the production of the thesaurus.

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Activities of the Commission of the European Communities

This paper was prepared by Aslib as a background paper for the Joint Consultative Committee of Aslib, the IIS, the LA, SCONUL and the Society of Archivists, and is reproduced here as likely to be of general interest.

Introduction

THE COMMISSION of the European Communities is one of the four components of the institutional framework set up to initiate and implement policy relating to the three European Communities, the European Economic Community, the European Coal and Steel Community and the European Atomic Energy Community.

The Commission has thirteen members of which all except the President carry portfolios relating to specific responsibilities. Two of particular interest in our field are those of E. Davignon, responsible for energy; research, science and education; scientific and technical information and information management; and the Joint Research Centre; and of Christopher Tugendhat, responsible among other things for the Office for Official Publications of the European Communities.

The day-to-day work of the Commission is carried out through the medium of the President's Office which includes the General Secretariat, and nineteen Directorates-General of which the following are particularly relevant:

- *DG III. Internal Market & Industrial Affairs.* Brussels
  - Directorate D. Section 4. Intellectual property
- *DG IX. Personnel & Administration.* Brussels
  - Directorate D. Translation, documentation and library.
    - Section 2. Library
- *DG X. Directorate General for Information.* Brussels
  - Directorate B. Decentralised information activity.
    - Information officers in member states and elsewhere.
- *DG XII. Research, Science and Education.* Brussels
  - Directorate A. Education, training and cultural questions.
    - European Documentation Centres
  - Directorate B. Research and development policy
- *DG XIII. Information Market and Innovation.* Luxembourg
  - Directorate A. Transfer of technology and industrial property
    - Section 2. Patents
    - Section 3. Department for Scientific and Technical Communication
  - Directorate B. Information management
- *Office for Official Publications of the European Communities.* Luxembourg

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The total staff employed by the Commission is just over 8,000 of whom some 40 per cent are directly or indirectly concerned with linguistic work.

In 1979 an independent review body was set up to examine the Commission's organization and staff resources and to make recommendations for implementing some kind of reorganization, probably in 1981. The main proposals include reducing the number of portfolios to eight (or ten when Greece, Spain and Portugal join the EEC) with a corresponding reduction in the number of Directorates-General to twelve plus the Secretary-General's Office. Under this plan DG XIII would be divided; the Directorate for Transfer of Technology becoming part of the DG for Energy and the Directorate for Information Management becoming part of the DG for Industrial Affairs.

Information transfer

From the library and information point of view, the most relevant Commission activities are those associated with DG XIII, headed by Raymond Appleyard, and the Office for Official Publications, headed by Walter Verheyden, both in Luxembourg. Directorate A of DG XIII, headed by Jacques Lannoy, is concerned with a wide range of activity under the general heading of transfer of technology and dissemination of information. Section 3 headed by J. M. Gibb has been particularly concerned to encourage co-operation within Europe to improve the availability and bibliographical control of 'grey' literature, including reports, translations, conference proceedings, etc and has held a number of seminars and meetings on these topics. One practical result has been an agreement between BLLD in the UK, Commissariat pour l'Energie Atomique in France and Fachinformations-zentrum Technik in Germany to co-operate in the collection, indexing and delivery of grey literature and to produce a joint database which will be available on Euronet/Diane in due course and will probably be supported by a hard copy publication. Initially the scheme will be limited to scientific and technical reports.

Directorate B, headed by Georges Anderla, has perhaps, made the most impact on information work. The Directorate's work is based on a series of three-year plans which are sanctioned by the Council of Ministers. An important link in the chain is the Committee for Information and Documentation in Science and Technology (CIDST) which has two representatives from each of the nine governments (John Gray of BLRDD and Cliff Nicholas of the Department of Industry are the UK representatives) and which acts as the Council's agent on policy matters and advises the Commission on the execution of that policy. The secretariat for CIDST is provided by the Commission and the latter must report periodically to CIDST on measures taken and results obtained.

The principal objective of the first and second three-year plans (1975–77 and 1978-80) was to make a start with the creation of a 'common market' in information of which the development of a common communications network EURONET is the first step (see map). Euronet started operating in 1979 as a telecommunications network but DIANE, the information network superimposed upon it, was not formally opened until February 1980. When one considers that the network has been developed by nine separate PTTs, each having a monopoly in its own country, with more to be added shortly, and that the system is to be operated in a six-language environment, the result is no mean achievement on the part of the Commission. There are now twenty-one hosts connected to Euronet offering, between them, over 100 databases (some, it is true, already available from America), mostly bibliographical ones. Over 1000 Euronet passwords have been issued although not all are yet in use.

The second three-year plan provided for EEC studies and support in such areas as training, promotion, development of new systems, investigation of user needs, standards, a common command language which is already being implemented, multilingual tools and pilot programmes for advanced information technology. To promote the new network a Euronet/Diane Launch Team has been set up, headed by Barry Mahon. The members of the Launch Team are not permanent staff of the Commission and their main functions include marketing, user support, monitoring traffic, and general liaison with PTTs, hosts, database producers and users.

A number of mechanisms have been created for ensuring user participation in Euronet/Diane. A User Forum has been held approximately twice a year in Luxembourg and attended by representatives of the various national online user groups and international organisations (P. W. Williams, Chairman of the UK Online User Group is the British representative). Such meetings have enabled the Commission to keep users in touch with current developments and to obtain feedback from users on EEC activities.

Since 1977, with secretarial support from the Commission, a number of information centres in Western Europe have been co-operating in a referral network designed to increase the effectiveness of online operations in Europe. Countries represented include Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Netherlands, Norway, Portugal, Sweden, Switzerland and the UK. The centres, of which Aslib and UKCIS are the UK representatives, provide help and advice to users on most aspects of online operation as well as carrying out online searches for their own users and acting as referral centres.

Much of the emphasis in carrying out the first three-year plan was on the development of large intergovernmental systems of the INIS/AGRIS type or more limited systems involving co-operation between two or more governments in such fields as agriculture, environment, metals and energy. It was expected that there would be, in due course, a transition from public sector to private sector projects after the American pattern, but the transition did not materialize. Following a meeting held in Luxembourg in June 1979[1] a new programme was developed aimed at encouraging the supply and use of information systems. A new Information Supply and Market Unit was created within DG XIII, headed by Piet van Velze, charged with stimulating the development of both the information market and information industry in Europe.

Two main lines of action have developed. First the promotion of a European Information Providers Association in order to establish a mechanism for consultation with the industry. The inaugural meeting was held in November 1979, followed, in spite of some initial opposition from EUSIDIC (European Association of Information Services), who claim that they already represent the information industry in Europe, by the first general assembly in June 1980 with members drawn from France, Germany, Italy, the Netherlands, Norway and the UK. The second approach was to issue a call for proposals for development of new 'value-added' information systems, i.e. factual or 'hard' databases or packaged information tailored to particular needs, with the Commission meeting 25 per cent of the development cost, or even 49 per cent for projects of exceptional relevance. Over 260 proposals were eventually received from which about 20 have been chosen. Roughly 25 per cent of the available subsidy has been awarded to British proposals, and the same to French projects, the other 50 per cent being divided among the remaining seven countries.

Europe is particularly deficient in databases carrying commercial, business, legal and statistical information of local significance, in comparison with North America, hence the Commission's efforts in this direction. And, of course, having invested about ten million pounds in the creation of Euronet, the Commission is anxious to see full use made of it. However it seems likely that, within a few years, most European countries will have interconnected packet-switching networks so Euronet's main contribution may be as a catalyst rather than as an enduring service. On the other hand, DIANE, which represents the intellectual side of the network, is a much more fundamental departure from existing systems in that it will provide a number of services which are normally the province of database producers and hosts. Apart from a continuing news service about developments in the network (*Euronet/Diane News*), a help desk and an enquiry service, and advice on operational problems, it is seeking to create back-up services for dealing with such problems as document delivery and the assessment of the value, accuracy and reliability of the information processed.

The Commission is only too well aware that in the industrial context, Europe has so far failed to mobilise its major asset—that of continental scale. Its market is still divided by different standards and practices and it has not succeeded in creating the common market of ideas or mobility of talent which exists in North America. In the information field this lack of coherence exhibits itself in problems of standardization, intense national competition to develop different systems e.g. the British/French rivalry in the development of viewdata systems, or in different political viewpoints on the role of government intervention in the creation of services.

In the third three-year plan the Commission's emphasis is clearly on the development of the private sector. Its proposals for encouraging the growth of a European Information Industry include:

1 the creation of a favourable climate for information transfer of all kinds including the harmonization of legal and fiscal policies within the Community;
2 the improvement of access to information produced and held by governmental organizations through systems provided by the private sector;
3 the provision of aid to private investors by facilitating contacts between privately funded information producers, by carrying out market studies, by helping to overcome language problems and by the rationalization of existing systems;
4 accelerating the transfer of information to small and medium-sized companies by encouraging the creation of information distribution systems adapted to the specific needs of users;
5 undertaking the training of 'intermediaries' in the use of advanced information technology;
6 encouraging the provision of more hard databases in the economic, statistical, commercial and technological fields by direct financial assistance;

7 opening up world markets to European information services by offering technical, legal, commercial and financial assistance for projects in associated countries (e.g. those linked to the Community by various conventions).

Publications

The Office for Official Publications of the European Communities is responsible for the production and sale of the *Official Journal* and other publications. The Commission's policy in relation to official publications and the various problems which have arisen relating to availability and bibliographical control have been recently described in some detail[2] and are not elaborated here. However it should be noted that not all of the material produced by the Commission is handled by the Office for Official Publications. Approximately 50 per cent of the output of DG XIII for example is handled by commercial publishers in the interests of wider dissemination. *Euronet/Diane News* is published by DG XIII itself as a special supplement to *Euroabstracts* and studies are now being undertaken for the publication of a new journal on aspects of multi-lingualism which affect information transfer.

Multilingual Problems

The need to operate in a multilingual environment raises problems, not only on philosophical or political grounds but because there is a significant economic penalty associated with such an operation which puts the Community at a disadvantage compared to, say, North America. There has therefore been, within the Community, a revival of interest in machine translation and some progress has been made in computerized terminology systems and the use of terminological banks which can be interrogated online.

SYSTRAN, the system of automated translation developed by the EEC, initially for W. European language couples, now includes eight dictionaries, the largest being the Russian-English dictionary covering about twenty scientific areas. It is believed that the system is flexible enough to be extended to non-technical subjects such as parliamentary debates and to cover more language couples. It will be used to translate some Euronet/Diane bases selectively and contacts have been made with a number of database producers to investigate the possibilities.

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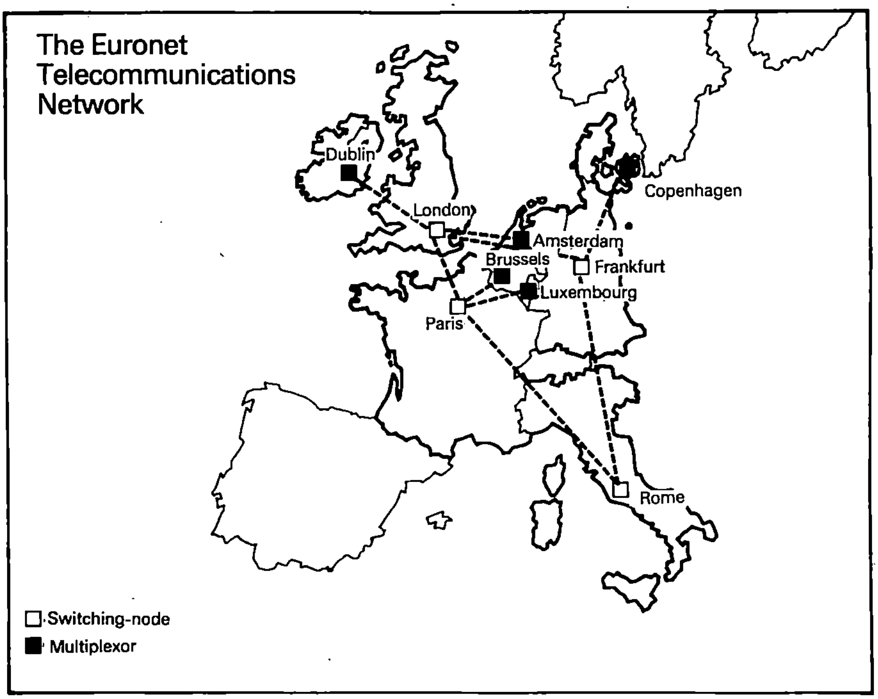

The Euronet Telecommunications Network

Letters to the editor

PROCESSING OF ACQUISITIONS

I read with much interest Derek Law's article 'Acquisitions and their processing in Edinburgh University library: results of a survey' in *Aslib Proceedings* 32(11/12) November/December 1980, pp. 459–467. Mr Law does not however mention that the methodology described was first used not by SCOLCAP in 1973 but by the original three BLCMP libraries, including the University of Birmingham, in 1968–69.[1] There are some interesting comparisons in the latter library's data, e.g. 33 per cent of acquisitions were published in the last four years, but only 35 per cent of all items were published in the U.K., and only 52 per cent of all items were English-language.

Similarly Mr Law's comments on the poor currency of British Library MARC records will occasion sad feelings of *déjà-vu* for many of your readers. Indeed, one of the strengths of co-operatives such as SCOLCAP, SWALCAP and BLCMP is that they are able to some extent to by-pass this problem.

Perhaps Auld Reekie, having now emulated Birmingham's survey methods a decade on, will feel able to overcome its misgivings and enter the world of automated cataloguing within a similar timescale.

T. French
Assistant Librarian
University of Birmingham

REFERENCE

1. HALL, A.R. *et al. Potential use of MARC records in three libraries: report of two surveys carried out for the Birmingham Libraries Co-operative Mechanisation Project.* Council of the British National Bibliography, 1971. (MARC documentation service publication, no.6)

INTERLIBRARY LOANS

We have noted Mr Carson's paper on 'Requests in biomedicine not available through interlibrary loans',[1] with its unsurprising message that inaccurate ILL requests yield worse results than accurate ones but can to some extent be improved by more checking, especially against computer databases. We hope to prepare shortly a constructive paper on bibliographic checking, about which some confusion seems to exist, and on which recent experiments we have conducted shed some light. Meanwhile, we would be interested to see what one could do with Mr Carson's unsatisfied requests, if he cares to send them to us in their corrected form.

M. B. Line
Director General
British Library, Lending Division

REFERENCE

1. CARSON, J. Requests in biomedicine not available through interlibrary loans. *Aslib Proceedings,* 32 (11/12), November/December 1980, 438–443.

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The plant kingdom

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Paper presented at the Aslib Biological and Agricultural Sciences Group Meeting, British Museum (Natural History), London, 11 and 12 November 1980.

Introduction

ONE OF THE major roles of plant taxonomy (in common with other branches of biological taxonomy) is the production of a classification so as to allow the diversity of nature to be broken down into units which can be recognized, named and communicated about. As Stace (1980) has recently stated, 'The need for some system of classification is absolute, for it is only by first naming organisms and then grouping them in recognizable categories, that one can begin to sort out the vast array which exists'.

Scientific taxonomy and nomenclature of plants had its origins in Europe in the 18th century and was based on much earlier 'folk taxonomies'. A key figure was Linnaeus who standardized nomenclature and classification through the use of such devices as the binomial system, rational methods of description and more precise terminology. More significant possibly, was the fact that Linnaeus's *Species Plantarum* was, in the main, a codification of the earlier folk taxonomies of north-western Europe. Many of the species be recognized corresponded to well-known and generally recognized components of such folk classifications and were, therefore, easily distinguished and clearly circumscribed. As I have pointed out on another occasion (Heywood, 1980) Linnaeus could only have completed this task of codification around that time (1730–1771) since the number of species and genera becoming known was increasing rapidly by the time of his death in 1778, to such an extent that a synthesis by a single person, starting from the earlier confused literature would probably not have been possible. The work of Linnaeus was made possible by a series of factors:

(1) the prior existence of folk taxonomies and traditions which had been recorded in the admittedly chaotic literature.
(2) the superficial state of exploration of the natural world of plants and animals, especially in the tropics, so that only a relatively small number of species was then known.
(3) Linnaeus's outmoded scholastic Aristotelian philosophy and his sense of divine mission.
(4) Linnaeus's acceptance of divinely created, static, invariant species.
(5) The use and establishment of binomials for species, replacing the earlier polynomial system.

Aslib Proceedings, 33 (4), April 1981, p.121–128. Printed in Great Britain

Species Plantarum was published in 1753. It can be regarded as the first Flora of the World (as then known) and was to some extent a revision, classification and updating of Bauhin's catalogue or Pinax (1623). *Species Plantarum* recognized 5,890 species grouped into 1,097 genera, 110 orders and 25 classes—the family was not recognized by Linnaeus who regarded the genus as the basic unit of his classification.

The phase of imperialistic expansion

In the century after the publication of *Species Plantarum* the whole face of plant taxonomy was changed. Firstly, there was an acceleration in the rate at which the flora and vegetation of the world beyond Europe was explored. This in turn led to the establishment of the major botanic gardens and herbaria. The material had to be studied, classified and named so that it could be further exploited for whatever purpose, scientific, cultural or economic. This phase of imperialistic expansion (Heywood, 1974) produced the main corpus of taxonomic literature—Floras, monographs, handbooks, etc. on which we rely today.

The inventory of plants

In terms of basic inventory, about 300,000 green plants are recognized today, the majority of them Flowering Plants, and 120,000 or more fungi (Table 1). There is debate about the precise figures since it is dependent on taxonomic judgement and revision of groups. These are currently reckoned to be about 250,000 species of Flowering Plant but some authors suggest there are twice as many. On the other hand, the number of binomials listed in *Index Kewensis* is around 928,000 suggesting about 2–4 synonyms per species recognized. The number of new species being described annually—about 4,000—is now much less than earlier in the century. As will be seen from Table 1, the great majority of Flowering Plants are tropical in distribution,

TABLE 1. *Estimates of the numbers of extant species in the principal plant groups*

	Worldwide	*Tropical*	*Tropical Africa*	*Tropical Asia*	*Tropical America*	*Europe*
Flowering Plants	250,000*	160,000	30,000	35,000	95,000	11,500
Fungi	120,000	90,000	20,000	20,000	50,000	
Ferns	12,000	11,000	1,000	6,000	5,000	150
Mosses	12,000	9,000	—	—	—	
Hepatics	11,000	7,000	—	—	—	
Algae	17,000	—	—	—	—	
Lichens	16,500	—	—	—	2,500	

*Many tropical botanists give a much higher estimate—up to 500,000 species (cf. Schultes and Hofmann, 1979). Also the fungi have been estimated as up to 250,000 species by several authors, and the algae at 100,000 species.

particularly in tropical America where large areas are poorly known botanically. It is to be expected that considerable numbers of new taxa will be described from such tropical regions over the coming few decades although substantial numbers will become extinct before they are ever described because of the rate at which vegetation is being destroyed in some areas.

The number of active plant taxonomists in the world has recently been estimated by me at 600–800. Most of these are in temperate countries which also possess the greatest resources in terms of herbarium collections and libraries (Heywood, 1980). Europe in particular houses about a third of the world's herbaria (c.350) and something approaching half the collections in terms of numbers of specimens (c.90,000,000 in total). Yet the number of Flowering Plants and Ferns in Europe is 11,557 species (according to *Flora Europaea*). There are a further 45,000,000 specimens in the Herbaria of the United States whose flora can be estimated at some 15–17,000 species. By way of contrast there is only a handful of major herbaria in the tropics. In the new world tropics about 95,000 species of Flowering Plants are estimated to exist yet the 90 or so herbaria in the countries there contain just over 3,000,000 specimens. So much then for the inventory and resources both physical and human. There is clearly a major imbalance of available resources: the richer the flora, the poorer the institutional and manpower capability.

Storage and publication of data

Taxonomic data consists of (1) what we may call label-data—ie details of the collection, such as locality, ecology, date, collector, reference number, etc; and (2) information extracted from the specimen by a wide variety of techniques (morphology, anatomy, chemistry, cytology, etc). In a sense taxonomy has no data of its own—only those of the other disciplines which supply the data (morphology, anatomy, cytology, embryology, etc)—since it is a means of handling and processing information. In the last few decades there has been an increasing use of an ever expanding range of characters as the result of the application of chemical, physical or electronic techniques of analysis, including light and electron microscopy, chromatography, electrophoresis, amino acid analysis, etc. The data are therefore presented as micrographs, spots on chromatography paper, bands on electrophoretograms, graphs, print-outs, etc. The label-data have changed little in the past two centuries, although there is often today a greater degree of precision. The taxonomic data have, however, become enormously diverse and complex.

The vehicles for publication of taxonomic and label data are many and various. They include indexes such as *Index Kewensis* (1895 as to date) which lists all binomials of gymnosperms and angiosperms published, and, as from the latest quinquennial (16th) supplement, also infraspecific taxa. Generic names are listed in *Index Nominum Genericorum*, published originally as a card index and later (1979) as three volumes of *Regnum Vegetabile*, giving details of place of publication, nomenclatural information, and indication of type-species. One of the most widely used compilations is Willis's *A Dictionary of Flowering Plants and Ferns* eighth edition by H. K. A. Shaw (1973) which lists all family and generic names and attempts to indicate which are nomenclaturally correct and which are synonyms.

Indexes to taxonomic literature of plants as opposed to lists of names include the *Kew Record of Taxonomic Literature* which subsumed several previous abstracting journals or indexes, and attempts to cover the world literature of plant taxonomy. Its first volume covered the year 1971 and volumes for the years 1972, 1973, 1974 and 1975 have been published. Unfortunately the compilation and publication of this valuable index is substantially in arrears of the data it abstracts.

The traditional method of publication of taxonomic data (apart from papers in scientific journals) is by way of Floras and monographs. The function of a Flora is 'to establish how many groups there are in the area concerned that merit the rank of genera, species, subspecies, etc, indicate how they may be recognized by means of keys and descriptions, where they may be found and under what ecological conditions'. (Heywood, 1973). Individual Floras, of which there are thousands, fulfil this function reasonably well. Some are detailed and almost monographic in scope such as *Flora Neotropica* while others are superficial and give little detail, sometimes not even descriptions or keys. A survey of the kinds of Flora is a subject in itself and reference can be made to Davis & Heywood (1963, ch.8), Heywood (1973) and Frodin (1978) for further discussion.

No complete world listing of Floras is available yet, although such a guide is in process of publication (Frodin, 1980 in press). An earlier publication, Blake & Atwood, *Geographical Guide to the Floras of the World* (1942, 1961) is very detailed and informative, but sadly out of date and covers only parts of the world. The list of 'basic' and 'standard' Floras given in *Flora Europaea* (Tutin, Heywood et al., 1964, 1968, 1973, 1976, 1980) is useful for Europe.

Another important aspect of descriptions in Floras is that they are abstracts of knowledge prepared for practical convenience, and do not necessarily record much of the information used by the taxonomist during the decision-making process. However inadequate Floras may be in terms of data storage, they play an important role in the collection, collation and revision of floristic information and presenting it in a ready-digested form for a wide range of users. Taxonomic revisions and monographs undertake such a task at a more detailed and profound level. The systems of producing Floras, usually organized on a local or national basis ensures that there is minimal delay between the original publication of new floristic/taxonomic information and its presentation in easily accessible form to a much wider public. I have frequently argued during the past ten years for the need to view Floras more in terms of the needs of consumers and it is gratifying to see such views receiving support from major centres such as Kew and Leiden. Thus Brenan (1979) writes:

> 'Should not we seriously consider the merits of favouring floras that are concise but less time-consuming to produce and less costly to buy? Might the monographic revision be better as a separate work in its own right rather than an integral part of a flora?'

Jacobs (1977) likewise argues for a simplification of the technical jargon which characterizes the 'hard core' professional Floras.

The preparation of any Flora must involve a compromise between degree of completeness and authoritativeness on the one hand, and what can be achieved with the amount of time, money and effort that can be devoted to the project, on the other. The *Flora Europaea* project with which I have been associated for the past 20 years or so, has been successfully completed, largely because the editors set themselves the target of producing a concise and complete Flora of the flowering plants and ferns of Europe in the shortest possible time. As Jonsell (1979) has recently commented:

> 'By evaluating critically the overwhelming information and by revision of taxonomy and nomenclature, Flora Europaea gives ready access, directly and indirectly, to an enormous amount of knowledge.'

Floras normally contain descriptions and other information relating to families, genera, species and subspecies and/or varieties. The handling of infraspecific variation poses many problems since one is faced with the problem of fitting the complex and inter-related products of organic evolution into a nested hierarchy with the consequence that only a restricted number of relationships can be expressed. The kinds of variation to be handled are very diverse. It is at this level that users of taxonomy often have very precise ideas of what information they want to be handled—biosystematists and genecologists who may wish to handle and describe various kinds of microevolutionary situations; ecologists who want to deal with various ecological factors or relationships; agriculturists and horticulturalists who want to have a means of identifying and describing cultivars, pure-lines, physiological variants; phytochemists (some at any rate) who want to distinguish chemical variants, etc. The demands made on the taxonomist at the infraspecific level are more exacting and clearly formulated than at the species level and above.

The difficulty about using informal categories such as the -deme terminology (Gilmour 1960) for expressing infraspecific variation is that they are not well suited for ease of communication in that common names are used and they are not registered or typified in the way that the formal taxonomic categories are. On the other hand they are flexible, and because they do not require formal names, the problems of nomenclature, synonymy, etc are avoided.

The data of systematic botany are, to some extent, compiled into handbooks such as Metcalfe & Chalk's *Anatomy of the Dicotyledons* (1950) and the series *Anatomy of the Monocotyledons* edited by Metcalfe, of which six volumes have appeared to date; Corner's *The Seeds of Dicotyledons* (1976), Roth's *Fruits of Angiosperms* (1977) and the various chromosome atlases such as Darlington & Wylie (1955), Bolkhovskikh et al. (1969), Löve & Löve (1975, 1976) as well as the *Index to Plant Chromosome Numbers*, an annual listing published in *Regnum Vegetabile* and the series of Chromosome Number Reports edited by A. Löve and published regularly in issues of *Taxon*. Chromosome number information is better recognized than any other of the kinds of data just mentioned yet as Favarger (1978) has recently pointed out, it is remarkably difficult for a research worker to ascertain whether or not a chromosome count has been published before. Compilations of systematic chemical data are Hegnauer's *Chemotaxonomie der Pflanzen* (1962–69) and Gibb's *Chemotaxonomy of Flowering Plants* (1974) yet new data are published at such a rate that these handbooks are already out of date. There is in practice no ready means of access to the mass of data of systematic botany published in the literature except through Floras and monographs for some limited fields, and through the chromosome listings for chromosome number data (but not other classes of cytological data). The various abstracting journals such as

Biological Abstracts, Current Advances in Plant Science, The Kew Record of Taxonomic Literature, Excerpta Botanica, are either too limited in their coverage or insufficiently detailed. A very useful tool is the reviews and extensive bibliographies given in the *Fortschritte der Botanik* covering the systematics and evolution of seed plants and other groups.

Electronic data processing

It may appear paradoxical that taxonomy which is largely concerned with the handling and processing of information has made little use of modern techniques of electronic data processing. There has, of course, been the development of the field known as numerical taxonomy or taximetrics which is concerned with the use of EDP in clustering and discrimination—classification and key making. But the use of EDP in floristic and taxonomic research, for the compilation of lists, outline Floras, and for the handling and storage of the vast data base of taxonomy has hardly begun. As Raven (1977) comments:

> '. . . it seems all but incomprehensible that we have not made wide use of electronic data processing equipment to keep track of the units being classified and allow the much more efficient accumulation of information about them. There is literally no other way in which this can be done, and the fact that funds have not been appropriated to make it possible suggests to me that society at large does not assign a particularly high priority to the task of cataloguing organic diversity'.

The most ambitious EDP programme in plant taxonomy to date has been the ill-fated Flora North America project which was designed as a computerized data bank or information system with continual updating (Shetler, 1971: Morse et al., 1971). This was unfortunately too ambitious, complex and expensive to receive full funding. We are still, it would seem, a long way from being able to set up a general standardized taxonomic information storage and retrieval system for plants. A recent development has been the inclusion of a project for the establishment of a European Taxonomic, Floristic and Biosystematic Documentation System in the Additional Activity for taxonomy by the European Science Foundation.

Nomenclature

Botanical nomenclature is governed by the International Code of Botanical Nomenclature. The current Code had its origins in the Rules of Nomenclature established at the Paris Congress in 1867, but acquired its present basic form at the International Botanical Congress held at Cambridge in 1930 and was last amended and ratified at the 12th International Botanical Congress held in Leningrad in 1975 and published in 1978.

The provisions of the Code cover the names of taxa, publication of names, the principles of priority, the type-method, name changes and hybrids. It does not, however, deal at all with matters of taxonomy.

Cultivated Plants are covered by a separate Code—International Code of Nomenclature of Cultivated Plants. A useful guide to the Codes and other aspects of biological nomenclature is given by Jeffrey (1977) which makes the important point that 'should systematists adopt some system of classification other than the hierarchical (or 'Linnaean') systems that the Codes are designed to serve, then they not only may but ought to adopt systems of nomenclature (or numericlature) other than those laid down by the Codes.' This paper has been restricted to considerations of hierarchical classification in plant taxonomy since they are almost exclusively in use.

As regards the Codes of Nomenclature, they do provide a rational basis for the naming of plants and lead to a high degree of stability, despite their necessary legalistic and cumbersome style. The only substantial area of debate concerns the possible conservation of specific names—*nomina specifica conservanda.* Although the Botanical Code allows for the conservation of generic names, all attempts to introduce conservation of specific names have failed, despite strong lobbying from horticultural interests. Some of the greatest difficulties in applying the Code stem from interpretation of the current rules regarding effective publications, especially of non-conventional printed matter such as theses, symposium handouts, etc (see Nicholson, 1980).

Summary and conclusions

Plant taxonomy, by its very nature, is intimately concerned with the handling and arrangement of both published and unpublished data about plants. It has established, over the centuries and especially in recent times, a complex interrelated series of methods and channels for its purpose of assembling, collating, assessing and presenting information. For conventional (orthodox) taxonomy, this information is handled at national, regional and international levels and finds its expression in the form of published lists, indexes, catalogues, monographs, Floras and the like. Most countries organize (or have organized for them) up-to-date Floras which are the primary method of making taxonomic information widely available to the public. Although many thousands of Floras exist, there are still many areas of the world (such as parts of tropical America and South East Asia) for which no recent or comprehensive Flora is available. The completion of floristic surveys of such areas and the publication of Floras is a matter of high priority because of the threats to the habitats concerned, and the use of electronic data processing will be necessary, if this task is to be achieved in time.

Current hierarchical classifications, methods of publication and nomenclatural codes combine to form a satisfactory basis for botanical taxonomy and its users so far as morphological information is concerned. The storage and retrieval and assessment of other kinds of information used in and relevant to taxonomy is much less satisfactory and can only be improved substantially by the use of electronic methods of modern information science.

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Cultivated plants

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ARTICLE 28.1 of the current (1978) edition of the International Code of Botanical Nomenclature states: 'Plants brought from the wild into cultivation retain the names that are applied to the same taxa growing in nature'. At first sight the provision seems worse than unnecessary, in that we know for a fact that many wild plants acquire new and very different names when they are cultivated. But, as is often the case, a little reflection and we can see what the Code intends to say—namely, that there is only one system of scientific, botanical nomenclature, and that the same scientific name applies to a taxon whether it is growing in the wild, or stored in a herbarium, or cultivated in a garden.

British and North American gardeners have been well served by a range of publications: the *R.H.S. Dictionary of Gardening* (4 volumes and 2 supplements. Oxford: Clarendon Press 1951–1969), Bailey's *Standard Cyclopedia of Horticulture* (3 volumes. The Macmillan Company. Reprinted 1939), Bean's *Trees and Shrubs Hardy in the British Isles* (8th edition John Murray, 1970–1980), Rehder's *Manual of Cultivated Trees and Shrubs* (2nd edition. The Macmillan Company, 1940) and his monumental *Bibliography of Cultivated Trees and Shrubs* (Arnold Arboretum, 1949), not to mention the vast mass of data incorporated in the 182 volumes of the *Botanical Magazine*, first published in 1788 and still going strong. Nor would I dream of omitting my own, compact favourite, Zanders' *Handwörterbuch der Pflanzennamen* (11th edition. Verlag Eugen Ulmer, Stuttgart, 1979).

However, the author of a Flora which includes cultivated plants, or which deals exclusively with cultivated plants, is faced at the outset with a major problem—namely the general absence of complete and accurate records of the contents of gardens, and the unreliability of identification of many of the cultivated plants that have been recorded. Even if we restrict the scope of such Floras to the British Isles, we must acknowledge that, over the centuries, a great many plants have found their way into gardens and greenhouses without published notice of their arrival, and many more have been from time to time introduced, only to be lost to cultivation at a later, unrecorded date, while others survive under erroneous, or sometimes fictitious, names. A comprehensive Flora of plants cultivated in the British Isles becomes possible only when the contents of at least our major horticultural collections are properly tabulated.

At Kew, and elsewhere, computerization has at last made possible the accurate and up-to-date indexing of living collections. Since 1969, all plants coming into the Gardens, and those already there, have been systematically entered on data cards,

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which provide, as a minimum, the name and location in the Gardens, and, where known, the provenance and source of the material, and its distribution in nature. The data card makes provision for a very wide range of supplementary data relating to the habit, hardiness, flowering-period, scientific and horticultural merit of a plant, and whether it has been used in palynological, cytological, biochemical, anatomical or physiological research. Data from all these cards is ultimately fed into the computer, from which up-dated print-outs are available, either of the total collection, or of those particular parts of it which are the subject of enquiry. Gradually all the living collections at Kew are being reviewed in this way, and strenuous efforts are being made to check, and if necessary correct, the identifications and names of items indexed. The extension of similar schemes to other Botanic Gardens and Arboreta, and to horticultural collections under the administration of the National Trust, means that, hopefully, and in the near future, the compilers of Floras of Cultivated Plants will have ready access to much more accurate and much more complete sources of information than heretofore.

Other problems involve those categories of cultivated plants whose nomenclature falls outside the scope of the International Code of Botanical Nomenclature, and which falls within the International Code for the Nomenclature of Cultivated Plants, the latest edition of which appears to have been published as long ago as 1969 (International Bureau for Plant Taxonomy and Nomenclature, Utrecht). The history of the Cultivated Code is given by Dr W. J. Stearn as an introduction to the 1953 edition of the Code, and the broad aim of the Code is outlined under Article 3. It is to promote uniformity, accuracy and fixity in the naming of agricultural, horticultural and silvicultural cultivars (varieties) which are normally given fancy names, such as apple 'Cox's Orange Pippin', barley 'Proctor', *Juglans regia* 'King'. To obtain this uniformity, accuracy and nomenclatural stability, the Cultivated Code recognizes in addition to the formal ranks set out in the Botanical Code, an additional rank of cultivated variety, or cultivar, distinct from the botanical *varietas* or 'var.'. The cultivar is the lowest category under which names are recognized in the Cultivated Code, and consists of those varieties (in the popular sense) which are usually given non-Latin, fancy names, and which must be given fancy names after 1st January 1959, unless they are published in conformity with the Botanical Code. A cultivar name, whether in Latin form or not, is distinguished from botanical or popular names by being cited with a capital initial letter, and preceded by the abbreviation 'cv.' or enclosed in single quotation marks. From 1st January 1959 onwards it must be accompanied by a description, or by a reference to a previously published description, but this description need not be in Latin. Botanical names are ultimately based upon a type, generally, but not necessarily, a herbarium specimen. Cultivar names do not have types, indeed the word 'type' does not appear in the index of the Cultivated Code. The reasons are fairly obvious; most of the categories recognized under the Botanical Code are recognizable by morphological characters, generally (but not always) visible on the type material. A great many cultivars, distinguished by such characteristics as flavour, or scent, or disease-resistance, or early flowering or fruiting, simply do not lend themselves to the type specimen concept. Moreover the application of the formal processes of typification to a category frequently of ephemeral significance would, in the end, become overloaded and of limited usefulness. The cultivar is very often more important than the species, subspecies or variety from which it originated, and it is, to my mind, one of the shortcomings of the Cultivated Code, that it does not, or perhaps cannot, ensure that a name is uniformly applied to a single entity, or indeed that the same entity is not given more than one name. The Cultivated Code envisages the use of a mechanism, which is totally ignored by the Botanical Code. I refer to the registration of plant names, by recognized Registration Authorities, some International, some National, some statutory and some non-statutory. The object of a Registration Authority is to prevent the undue duplication of cultivar names, and to ensure some measure of distinctness between related plants with different cultivar names. The Cultivated Code (Article 53) admits that 'Acceptance of a name for registration does not necessarily imply judgment on the distinctness of the cultivar from others', but adds: 'the testing of cultivars for distinctness is, nevertheless, of the greatest importance and should, when possible, be carried out before a name is accepted for registration, as is done for agricultural and other crops in many countries'. It also sets out some recommendations for the Guidance of Registration Authorities, which require that names submitted for registration be accompanied by particulars of testing. Registration authorities are, in turn, called upon to compile and publish lists of cultivar names and synonyms, including, where available, data furnished by growers and testing stations.

No fewer than 60 genera or groups of genera and species are included in the most recent list of International Registration authorities, the groups ranging in size from horticultural heavyweights like Orchids, *Chrysanthemum*, Roses, *Rhododendron* and *Camellia* down to modest *Buxus*. These authorities, and their registrars, vary greatly in their approach to the problems of identification and naming; some have access to trial grounds and demand careful examination of each plant, and assurance of its distinctness from other cultivars before registering a name; others rely upon the collective memories of committees of experts, while a few, regrettably, are prepared to register a name on little other evidence than the testimony of the applicant. Curiously enough, while many groups of minor economic importance have their own Societies and Registers, many of the major agricultural crops are without an international registration authority or an internationally approved register of cultivar names. The sheer labour of compiling even a national register of an important crop plant is demonstrated by the National Apple Register of the United Kingdom, published in 1971 by the Ministry of Agriculture, where it is recorded that nearly 22,000 cultivar names of apples had to be investigated in order to register over 6,000 accepted names.

The data which should be required to accompany each application for the registration of a cultivar name would include parentage, modes of origin, description of characters of individual plants, range of variability, ecological tolerance, precocity, and other information of value to classifier and cultivator. Such information, and additional testing for permanence and uniformity of distinctive characters, is required when a plant-breeder applies for registration of his rights, in this country, under the Plant Varieties and Seeds Act 1964. Here, of course, successful application not only safeguards a cultivar name, but may bring considerable financial reward to the applicant, so the Plant Variety Rights Office must make stringent enquiries as to the newness, distinctness and permanence of the cultivar, and the uniqueness of its name. Such stringency is bound to delay the process of registration, and may be considered inappropriate where legal title and monetary gain are not involved. Nonetheless,

Zoological nomenclature and taxonomy

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SYSTEMATICS IS OFTEN used, or rather misused, as a synonym of taxonomy, to mean classification. Systematics is, however, a much more general term covering the study of the diversity of organisms, and includes such subjects as genetics, biogeography, taxonomy and nomenclature.

Taxonomy is the branch of systematics concerned with the classification of organisms into groups that we call taxa, based on similarities of structure, physiology, biochemistry, etc. The largest taxon of animals is the kingdom Animalia containing all the animals that have ever lived in the world. The animal kingdom is then subdivided into smaller taxa arranged in phyla (such as Chordata, Mollusca, Arthropoda), classes (such as Insecta), and orders (such as Diptera—the flies) and then further subdivisions into families, genera, species, and on down to the smallest distinguishable groups of individuals. The naming system that has been internationally adopted is that used by Linnaeus who in 1758 catalogued the then known species and cited each by two names (a binomen), the generic name followed by the specific name. All taxa containing groups of species, such as genera, families, orders, etc., were given a single name whereas all taxa subdividing species into subspecies and forms were given names additional to their binomen. By far the most important unit in classification is the species, which may be defined very broadly as an interbreeding natural population that does not interbreed with other such populations.

The size of zoological nomenclature

To get some idea of the problem when it comes to classifying and naming animals, there are over 4000 species of mammals and well over 8000 species of birds, but there are over 800,000 known species of insects and about 7000 additional ones are being described and named every year. The insects represent about three-quarters of the total number of described animal species, at present estimated to be over 1,100,000. Many of these species have been named more than once since 1758, and many of them are divided into subspecies and forms. No reliable figures are available but there must be at least another million such synonyms and varietal names, thus making a total of well over 2 million specific, subspecific and infrasubspecific names. To this

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must be added 300,000 generic and subgeneric names plus the names of taxa in family and higher ranks. Such is the size of the problem when it is suggested that there should be a data bank of all scientific names.

Inevitably when dealing with such numbers of names there is a need for a set of rules or Code for their formation and use. Several national codes were developed in the latter half of the last century and eventually the International Commission on Zoological Nomenclature was set up, by the III International Congress of Zoology at Leiden in 1895, to study the existing codes and to formulate a set of internationally acceptable rules that could be applied to the whole of the animal kingdom, including all fossil taxa.

The International Commission on Zoological Nomenclature

The ICZN at present consists of 25 taxonomists of merit and experience, from 16 different countries, serving on the Commission as zoologists and not as national representatives. It is run from its small secretariat in the British Museum (Natural History) and is dependent on the superb library and other facilities generously made available to it. The Commission has two main functions, one of them is to examine any proposed amendments to the Code and prepare a new edition when necessary. The other function is to deal with requests from zoologists for help with particular nomenclatural problems that arise in applying the rules of the Code retrospectively to all scientific works and names published since 1758.

The International Code of Zoological Nomenclature

The object of the Code is to promote stability and universality in the scientific names of animals, but in applying the rules of the Code changes in names are caused. These changes are a continual source of difficulty to all those who use them, especially librarians and non-specialist users. To obtain a better understanding of the reason for these changes let us examine the six main principles of the International Code of Zoological Nomenclature that regulates the scientific names applied to taxa at superfamily, family, subfamily and other family-group ranks, and to genera and subgenera, species and subspecies. The zoological Code does not regulate names of taxa below subspecies (i.e., varieties and forms) or above the rank of superfamily.

The Principle of Binominal Nomenclature is fundamental to biological nomenclature and states that the scientific name of a species, but of no other taxon, consists of two names, a binomen, the first being the generic and the second the specific name. As in *Noctua armigera* Hübner, [1808], the first letter of the generic name is spelled with a capital, and the first letter of the specific name must be spelled with a lower case letter, even if it is the name of a person. The name of the author, Hübner, and the date of publication of the work in which the name was established, [1808], may be added as optional extras. Square brackets around the date show that it is derived from external evidence and not from the work itself or its wrappers. If, as is often the case, the species is transferred to a genus other than its original one the specific name is then combined with the other generic name and the author and date, if cited, must be enclosed in parentheses (round brackets). For example, when

Noctua armigera was transferred to the genus *Heliothis* Ochsenheimer, 1816, its name was then correctly written as *Heliothis armigera* (Hübner, [1808]). Even more recently it has been transferred to the genus *Helicoverpa* Hardwick, 1965, and its name should be written as *Helicoverpa armigera* (Hübner, [1808]). It is not customary in zoological nomenclature to show the name of the author who made the transfer but it may be added after the parentheses.

The Principle of Priority is the next most important and states that the correct name for a taxon is the oldest name used for it provided that the name is not prevented from being used by any other rule of the Code, or ruling of the Commission. The action of this principle can be tempered by the Commission to prevent a change of well used names as in the example of *Archaeopteryx lithographica* when the Commission suspended the application of the Principle of Priority in this case and gave the well used name precedence. But usually a less well-known name is involved, priority must prevail, and a change of name is the result. Dates of publication are of prime importance in nomenclature and librarians should never discard wrappers, particularly of older works.

The Principle of Homonymy is the third of the fundamental principles and states that if a name is a junior homonym (i.e., duplicates an earlier name given to a different taxon) it must not be used as a valid (i.e., correct) name. The object of this is to ensure that the correct name for each taxon is unique, so that no two different groups of animals have the same name. For these generic names any one letter difference is sufficient to prevent them being homonyms of one another. For species-group names the specific name must not be duplicated within a genus.

The Principle of the First Reviser states that the relative precedence of two or more simultaneously published names is determined by the first reviser, and not as is sometimes thought, by their positions in the pages or lines of a work.

The Principle of Coordination states that a name established for a taxon at one rank is also available with its original author and date for a taxon having the same type at another rank within the same group.

The Principle of Name-bearing Types is the one which links nomenclature and taxonomy. It states that each named taxon has, actually or potentially, a single name-bearing type that provides the objective standard of reference by which the application of the name it bears is determined. For example, when an author names and describes a species he should designate a single specimen as its holotype. If he does not do so and the species is based on a series of specimens (i.e., syntypes), a single lectotype should be designated later from the syntypes. It may be that there is no actual holotype, lectotype, or syntypes; in such cases, or if the type has been lost or destroyed, and there is need of an actual type specimen to sort out a taxonomic problem, then a neotype may be designated. Similarly in the case of genera the use of a name must go with its type and a single species must nowadays be designated as the type-species at the time the genus is named. For genera named before 1931 the type-species must be designated from among those species originally included in the genus when it was named. It is the first designation that fixes the type-species. This rule has caused, and is still causing many generic name changes as the older genera were often very broad in concept and there may have been two or more different designations of species now placed taxonomically far apart, even in different families. Often an earlier type-species designation is found that is different from the traditionally accepted one and then either the rules of the Code cause a change in name or, for well known names, a case may be presented to the Commission asking them to fix a type-species in conformity with general usage. Family-group names are always based on a generic name and the taxon bearing that name is automatically the type-genus.

In deciding what is the correct name to use, classification must always come first. For example, individual specimens, and figures or descriptions of specimens, must be allocated into groups considered to be species. If any of the groups contain specimens that are name-bearing types then the rules of the Code must be applied to those names and in normal cases the oldest name is the correct one for that group. If any group does not contain a name-bearing type then it is probably an unnamed species which should be described and a name established.

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Bacteria

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Introduction

BACTERIA WERE UNKNOWN to man until the invention of the optical microscope and were first observed, along with Protozoa, by Antonie van Leeuwenhoek in 1675. However, they were not scientifically studied during the following 200 years and indeed as a science, Bacteriology is only a little more than 100 years old. Pasteur and Koch laid the basis of the modern science, and the late 1800s saw the discovery, description, and formal classification of most of the species of bacteria recognized to-day. It is a very rare event now to discover a 'new' bacterium: the aetiological agent of Legionnaires' Disease, *Legionella pneumophila*, is, however, one such example, much in the current news.

Bacterial taxonomy has to operate within several constraints that, in general, are not applicable (or not so applicable) to the taxonomy of higher plants and animals. First, of course, bacteria are very small which means there is no fossil record and morphology is of limited value to taxonomy. They reproduce asexually; they are ubiquitous in distribution with no geographical isolation, yet they are very adaptable to changing environment; the descriptions of the species are based in the main on biochemical composition and biochemical activities.

By a different standard, however, the bacterial taxonomist has to deal with what is a relatively small problem if compared with Botany or Zoology: the numbers of species recognized is only of the order of two to three thousand!

Classification

It is possibly more self-evident with microbes than with higher plants and animals that classification is simply an information storage/retrieval system. When we classify bacteria we are really classifying our knowledge of bacteria, not so much the bacteria themselves. Whilst it is possible to make some speculations about bacterial evolution, especially from the study of the genetic material (the DNA), bacterial taxonomy is in practice wholly phenetic, i.e. based on the to-day properties only. The classification is not phylogenetic.

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The species concept with bacteria is perforce an arbitrary, pragmatic one, not based on concepts of interbreeding populations or common gene pools, but simply species definitions that users find useful and convenient in their practical work.

The early bacterial taxonomists were victims of the variability bacteria can and do possess; there was a tendency to consider every newly isolated bacterium as a new species if it differed in just one or two features from any other bacterium up till then described. As progress was made in understanding bacterial behaviour, adaptability, and variation, an opposite trend occurred with taxonomists 'lumping' various species together and certain features in descriptions became necessarily somewhat more loose; for example: 'most strains ferment sucrose' or 'hydrogen sulphide usually produced'. However, a majority of bacterial taxonomists still held the view that some characters were in some way intrinsically more important than others. Often such 'important' characters were simply those that had been earliest observed and thus figured in the earliest classifications and subsequently became maintained as 'key' characters. There were some early bacteriologists (e.g. Winslow and Rogers, 1906) who appreciated that if certain characters were more important it was only because they were relatively highly correlated with other characters. But this line of thought had little effect on the practice of bacterial taxonomy until Sneath (1957) introduced so-called 'numerical taxonomy', which derived from his re-discovery of the work and ideas of the naturalist Adanson (1763). The basic tenets of numerical taxonomy are that *a priori* all characters should be given equal weight, mathematical-statistical methods can then be applied to calculate either correlations between characters or estimates of overall similarity between organisms and, finally, that taxonomic groups should be defined in terms of overall similarity, which means in effect based on highly correlated characters. Such a system becomes general classification only if based on as wide and unbiassed selection of characters as practicable, and usually one or two hundred characters are used. Numerical taxonomy has had wide, but not total, acceptance in microbiology, but in any case has forced the non-numerical taxonomists to use far more characters than they otherwise would have done. Numerical taxonomy is usually carried out with the aid of computers and a useful by-product has been the development of computer programmes for the numerical identification (as opposed to classification) of fresh isolates (Willcox *et al.*, 1980).

Molecular biology has had an important impact on bacterial taxonomy. The genetic information is coded as triplets of the four bases (cytosine, guanine, adenine and thymine) in the DNA. If the base sequences in the DNAs of two bacteria are the same, the genetic information is the same and the two bacteria are 'the same'. If the base sequences are totally different, then the two bacteria are totally 'unrelated'. Techniques are now available to determine whether the base sequences are indeed the same, totally different, or partially similar and to express this last possibility quantitatively. The techniques are laborious and very specialized, but are very useful if applied in conjunction with numerical taxonomy or, at least, very detailed classifications based on many characters (Owen and Hill, 1979).

Bacterial taxonomists rely then very heavily on investigating what bacteria do and their chemical composition. For both purposes living cultures need to be available and thus in bacterial taxonomy the nomenclatural Types of species are living cultures maintained (in perpetuity, hopefully, by techniques such as freeze-drying or lyophilization) in culture collections. In Great Britain there exists a network of several national culture collections each dealing with major groups and collections throughout the world are in contact with each other both informally and formally through membership in the World Federation for Culture Collections; WFCC has published a *World Directory* (Martin and Skerman, 1972).

Formal classification and nomenclature

Though, historically, various individual bacterial taxonomists have proposed their own classifications, general consensus will be found in the series of *Bergey's Manual of Determinative Bacteriology* (1st edition, 1923; 8th and current edition, 1974). This has grown from early editions compiled by a small committee (four, five, or six individuals) to now a truly international enterprise with many authors of short sections. The Bergey's Manual Trust was also responsible for the production of a book of bacterial synonyms, *Index Bergeyana* (Buchanan *et al.* 1966). Nevertheless, Bergey's Manuals are in no way recognized as 'official', and individual bacterial taxonomists are at perfect liberty to disagree with the classifications given in them and to devise their own (see introductory chapters to Cowan's dictionary, 1978; also useful for the technical terms used in bacterial taxonomy). The International Association of Microbiological Societies (IAMS, shortly to achieve Union status within the International Council of Scientific Unions, presumably as IUMS) has taken steps to try to achieve some degree of 'official' agreement by setting up a committee, the International Committee for Systematic Bacteriology (ICSB, of which I am the current Secretary). The ICSB itself has a series of taxonomic subcommittees each specializing in particular groups of bacteria, and a Judicial Commission to rule on any controversial nomenclatural matters. Bacterial taxonomists recognize that there can be no rules whatever regarding classification, but there should be agreed rules on how bacteria are named. And indeed there are: ICSB is responsible for the production and periodic revision of the *Bacteriological Code of Nomenclature* (current edition, 1976). Botanists claimed early jurisdiction over the nomenclature of bacteria, claiming they were plants, and it was not until about 1936 that bacterial taxonomists made moves to devise a Bacteriological Code independent of the *Botanical Code*. A drafting committee was set up in 1939, reported in 1947 and the first Bacteriological Code published in 1948, though incidently bacteria were not deleted from the Botanical Code until as recently as 1975.

The Bacteriological Code, like the Botanical and Zoological Code, includes a principle of priority of publication to establish which of two or more synonyms is the correct name. However, because bacteria at first came under the jurisdiction of the Botanical Code, the starting date for establishing priorities was Linnaeus' *Species Plantarum* of 1753. The 1976 Revision of the Bacteriological Code recognized the absurdity of such an early date for bacteria and took a novel way of up-dating it. A new starting date was established in the then future, 1st January 1980. On that date, the ICSB would publish *Approved Lists of Bacterial Names* (duly published: Skerman *et al.* 1980), to contain only those names that had some current meaning to taxonomists and for which, in the case of species or subspecies, there exist living type strains in named culture collections. Bacterial taxonomists used the 1976–1980 time period to sift through the old literature and make decisions on retention and deletion of names. This task was done in the main by the ICSB Taxonomic Subcommittees and resulted in reducing all the names that have been used for bacteria to merely some 123 names of higher taxa (Divisions down to Families) and about 2,170 names of Genera, Species and Subspecies. The 1976 Bacteriological Code also ruled that any future nomenclatural proposals must be made in the *International Journal of Systematic Bacteriology* (the official journal of ICSB), otherwise such proposals will have no standing in bacterial nomenclature just as all names prior to January 1980 have no standing.

Thus bacterial nomenclature has made a new start with 1980; future workers wishing to propose a name need not hunt through the old literature to ascertain whether the name has been used already; only a check against the 1980 Approved Lists and subsequent issues of that one journal are necessary. We, bacterial taxonomists, hope we have made bacterial nomenclature, if not classification, somewhat simpler for future generations.

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Classification of viruses for information retrieval

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A computer file, which may be consulted and updated online, has been compiled of all plant and animal viruses at present recognized. The data is arranged according to type of nucleic acid present and method of replication (Baltimore classification). An alphabetic list gives family, subgroup, etc., together with synonyms. A coded subset of viruses of veterinary importance is being devised for use in diagnostic surveys. The file is being incorporated with an 'in-house' current awareness system thesaurus.

PART OF MY WORK as an information scientist involves the provision of up-to-date references for the Institute staff, quite a large number of whom are involved in the study of various viruses. In order to provide a relevant collection of papers it was necessary to compile a reference source which would give background information about any virus revealed in scanning the literature. The most useful headings were as follows:

1. Hierarchy—family name of a virus, etc., or members of a family.
2. Nature of nucleic acid (and replication).
3. Host range.
4. Synonyms.

The most important factor for classifying viruses used in this study is the nature of the nucleic acid, although other factors, e.g., envelope composition or capsid morphology, etc., could have been used. I thus decided to group all known viruses according to the Baltimore system. (see Fig. 1.) Once grouped, a computer program was devised to list all entries alphabetically, Greek letters being spelt out in full. This enabled me, on finding a description of a novel virus to ascertain its family group, nature of nucleic acid and thus its relevance for S.D.I. Synonyms are included in both the classified and alphabetical arrangements, the preferred name being shown. As the files are held on tape, they may be consulted and updated online at the Institute.

From the complete listing a subset of viruses of veterinary importance has been drawn up by virologists and veterinarians at Compton. The list will be incorporated in an encoded form into the information library associated with the Compton COSREEL programme for recording events in experimental livestock. It may thus

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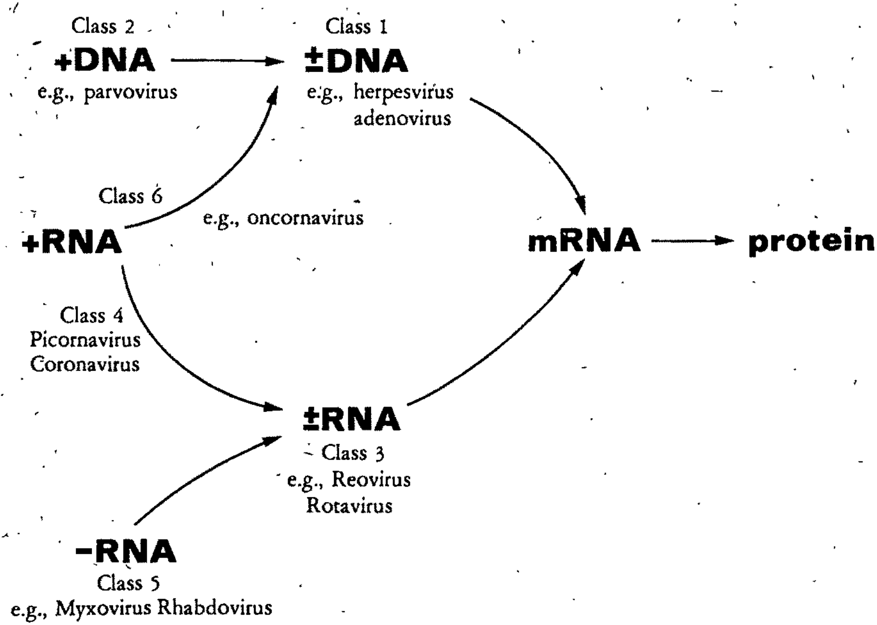

FIG. 1. *Nature of nucleic acid and replicative mode of viruses. Based on Baltimore's classification*

form the basis of Compton's Animal Disease Incidence Survey. The selection of viruses for this list is, at present, rather arbitrary, but accommodation has been made for this in the coding. It is expected to improve as real data is collected.

The full listing of viruses will be incorporated with the ARC's current awareness service thesaurus. This system operates on the ICI ASSASSIN package. The incorporation should enable better coverage of virological material for in-house consultation.

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Impact of Changes in Biological Classification on Biological Abstracts

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BIOSCIENCES INFORMATION SERVICE, or BIOSIS, is the world's largest English language abstracting and indexing service for biological and biomedical research; and since 1926 it has served the information needs of the world community of bioscientists.

In 1981, Biological Abstracts will contain 170,000 informative abstracts grouped in accordance with the primary emphasis of the article and assigned to one of eighty-four alphabetically arranged section headings. Each issue includes five computer-generated indexes—author (including personal or corporate names), Concept (or broad subject references), Biosystematic (broad taxonomic categories), Generic (genus-species names) and Subject Index based on specific words from the title, abstract and reference article. Our other hard-cover printed reference publication, Biological Abstracts/RRM (covering reports, reviews and meetings), utilizes computer-simulated abstracts (called Content Summaries). All entries have additional access points through the indexes. In 1981, 130,000 items will be published in BA/RRM which when combined with 170,000 abstracts published in BA will total 300,000 references in the data base.

BIOSIS offers a massive amount of information to both the manual user and to the machine user. In fact. the entire BIOSIS file contains nearly five million reports in which taxonomy plays a most important role. From the year the Generic Index was initiated, 1974, until 1980, we have listed a grand total of 1,337,759 taxonomic entries, although not all are unique. Through the use of computers in numerical taxonomy, a great surge of interest erupted[4] and more analytical studies on taxon relationships are forthcoming. These may result in new classification schemes, adjusted schemes, as well as startling revisions. The once accepted two kingdom classification has grown to three, then four, now five. And with these changes come massive revisions in the thinking of the interrelationships of organisms.

A revision of a classification system or a large change in the overall presentation of a hierarchical breakdown presents a formidable impact not only on the reader, but on the staff editors who study and index the organisms in the publications, and the entire data processing system—programming, coding, computer input, etc; not to exclude the marketing planning and preparation of users for the changes in the printed publications and in the magnetic tapes. Such were the problems with the overwhelming change in bacteriological classification with the revision of Bergey's Manual for Determinative Bacteria from the 7th to the 8th Edition.[2,3] The classification was a

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radical departure from current practice. There was no simple relationship between the taxonomic groupings used in the two editions and, certainly, if the 8th edition was to be adopted, great changes would have to be made in the data base.

In the new classification, names were completely altered, some were very long and involved, phrases and words in English substituted for Latinized terms. Recourse to formal higher taxonomy was no longer possible. Indeed, many formerly accepted taxa, including orders and even families, had been discarded. We could not immediately change our system: indeed, the literature did not reflect the new taxonomic changes of that order of magnitude immediately. But Bergey's 8th edition, nevertheless, remains the 'standard' international work, the one which the biological community would follow and in keeping with this, BIOSIS had to adopt its novel systematic approach.

In order to implement the expansion of the systematic classification scheme, the classification had to be analyzed. What were the main headings? What codes would have to be developed for the new entries? Do we consider going to the genus level (none of the other entries in the Biosystematic Index go to genus)? But this classification is irregular—no true hierarchy. How can this be equated to the previous system based on 12 orders? Conversion tables would be the only answer. We had to make compromises. First, we could not adopt, at this time, the Kingdom Procaryotae with its first division of the Cyanobacteria, the blue green algae. The second division. Bacteria, would be the point where we would begin, because to change our present two kingdom concept into a five kingdom concept, the entire Biosystematic classification would have to be revamped—and that would involve several years of work—(this we are investigating presently). Consultations were held with leading bacteriologists as to a compromise on what should be accepted completely, what was still uncertain and to what level could the breakdown be most useable.

Conversion tables and intermediate codes had to be developed for the new entries. The needs of the BIOSIS Previews Tape Users had to be met first.[1] Both a new code and an old code would have to appear in the machine record; however, the old code would be prevented from generating an entry for the printed index. Thus the impact of changing a classification was significantly affecting editorial procedures, programming techniques, production programs, photocomposition and publishing costs as well. But, the most important of all, the change offered the reader the most complete and current bacteriological taxonomic scheme authorized according to international standards; it reflected all the recent official taxonomic changes in name and classification for these organisms.

When the classification scheme was fully implemented, a leading bacteriologist mentioned to me that the '74 scheme would be scrapped in 1980 for an entirely new breakdown. Needless to say, such a statement places abject fear in our hearts, but if and when such an extreme revamping takes place, I'm sure we will be up to it as well.

In 1976, the International Committee on the Taxonomy of Viruses (ICTV) published official viral taxonomic changes. As we surveyed the classification we were using, we knew that a complete revision was in order. Since the inception of the Biosystematic Index in 1964, the viruses had been taxonomically separated into four general categories with separate index code numbers—unspecified viruses, animal, plant and bacterial. In addition, the animal viruses were affiliated with descriptor terms and the affiliations appeared in the Subject Index. The impact of changing the old method of handling viral taxonomic data into a totally revised framework did not cause us as many problems as the bacteria due to the simplicity of the old system. The 1976 system retained one entry for unspecified viruses and one entry for the bacterial viruses. ICTV reorganized the groupings which involved the animal viruses—viruses of vertebrates, viruses of invertebrates and viruses of vertebrates and other hosts. A leading virologist advised our combining the viruses of vertebrates with the viruses of vertebrates and other hosts. The animal viruses were divided into twenty-one index entries and each of these groups further divided into families of related genera. Thus the proposed index conformed to the familial groupings of these viruses. The plant viruses were subdivided into groups and required twenty-three index entries. Two entries in the new index overlapped the animal and plant virus categories; but both contained mostly animal viruses and a few plant viruses.

In 1979 the *Journal of Intervirology*[5] announced the virologists were revising and updating their system again. From this report, bacterial, plant and animal viruses had many entries. There were now 50 approved families and groups. In addition, three proposed or possible families or groups were included as well. No official names for individual viruses (or species) have been approved by the ICTV. Since a taxonomic structure above the level of a family has not yet been developed, any sequence of listing must be arbitrary. Listing families according to their host group is inconvenient because of the bridging families whose members infect more than one major host group. So in order to serve the biological community, it is necessary to adopt the most acceptable and approved scheme, but not necessarily the most complete. We find it not advisable to incorporate proposed or tentative families or groups among the approved taxa. But it is necessary to keep on top of these potential changes. Thus, the latest changes in viruses were incorporated. All editorial authority files were examined and revised. Correlation tables were prepared for individual viruses which had undergone a change in coding. A log of all changes made in the plant virus and animal virus authority files was prepared and all materials relevant to our machine users distributed.

We expect to totally revise the biosystematic index and are now studying the incorporation of the 5 kingdom breakdown. No doubt, within the next three years we will be repeating many of the same procedures we followed for the bacteriological and viral classifications of plants and animals. Our entire purpose in existing is to provide access points to the literature. We do not pretend to be the authorities; just the collaborators of information.

This leads me to a subject which substantiates this statement. BIOSIS, US and Zoological Record have entered into a cooperative project to establish a machine-readable system for taxonomic information—a Taxonomic Reference File, for use by abstracting and indexing services to verify taxa that appear in the primary literature. Subsequent to the feasibility study, consensus was reached between BIOSIS and the Zoological Record, with respect to areas of expertise, and agreement was reached on both essential and optional data elements. BIOSIS did the necessary design and programming work and files were provided by Zoological Record for input to the system so that it could be demonstrated. The file was designed to consist of a hierarchic file and a master file. In the master file all of the data elements available pertaining to a particular taxon would be included with the addition of the hierarchical position of the taxon. In the hierarchic file the same taxon would be associated with its super and sub-structure.

The system was loaded with information on some 40,000 organisms from the Zoo logical Record and has been demonstrated to a number of visitors both at BIOSIS and at a workshop, again sponsored by the British Library, held in London in January, 1979. Against the background of their comments and suggestions we have been rethinking our system design in order to involve the taxonomic community in the building of the file, and in order to assure that their input will enable the file to be what the community wants it to be. It was never BIOSIS's intent to establish a taxonomic reference authority file. Our purpose was to coordinate the necessary taxonomic information to validate entries that were to become a part of the taxonomic reference system. Many taxonomists have expressed concern about the choice of preferred names. Some have even shown concern about our choice of a name for the file.

We hope to achieve input and indeed to achieve ideas for the concept through an advisory panel. We would view the system as being owned by BIOSIS and its UK counterpart, but the data in the system would belong to the community. We see BIOSIS's contribution being one of providing a focal point for the coordination of information via this system and indeed the system design itself. We hope that input for the file will come from the user community, and that financial resources for loading the file, that is for input of data into this file, can be provided by some of the funding agencies who serve those user communities that we serve. The file will not be completed in 20 years. It probably will never be completed but a major portion of it can be done in less than 20 years. And, the file can be extremely useful in the meantime.

The current TRF design has two major components: (i) a computerized collection of organism names and associated data; (ii) the interactive computer system which will let users look at the data, add to or comment on it when authorized, create individually tailored subsets of the data for local use, and share findings with other scientists, all via an online computer network. Our objective is to provide the community with a reference tool which facilitates sharing of systematic information and rapid communication of new data. We are proposing a system which will give taxonomists an interactive role in building and maintaining the file. The general user will be able to search the file and examine its contents. In addition, approved users will be able to record their scientific findings and observations directly into the file in special user comment fields. Thus we can expedite the exchange of taxonomic data, although not provide for the kind of advance refereeing that goes along with journal publication. However, we plan to offset this by clearly identifying the input as the observation of a single user and by having such input reviewed and amended periodically by cooperating authorities. The user will also be able to copy portions of the TRF out of the main file and into a separate workspace area of the system. Here the user can add new information or make changes to suit his own needs. This facility would enable the user to create a modified version of the TRF (without affecting the contents of the main file) for producing museum catalogue cards, or to copy off a subset of the TRF which he could put up on his university's minicomputer. An additional feature which we are proposing for the TRF system is a limited message exchange facility.

In addition to the involvement of general users, BIOSIS proposes to solicit cooperation from authorities in reviewing and maintaining information in assigned sections of the file. For example, a cooperating authority might be responsible for reviewing and maintaining information on the geographical and geological ranges of a specified group of organisms. As part of this responsibility, the cooperating authority would review and possibly amend the observations and notes which users have added to that part of the TRF. In the proposed TRF system, BIOSIS would be responsible for coordinating the necessary data processing operations. In addition, BIOSIS would maintain the taxonomic hierarchy data and would coordinate and control the addition of new taxa to the system, with reference to respected authorities, of course.

When a new taxon is entered in the file it will be given a 'key' name (primary name under which the taxon is stored in the TRF) and will have five required pieces of information (data elements) completed: the author and date of the original diagnosis, its taxonomic level, the name of its hierarchical 'parent', and the name of the reference word or authority used to establish the level and hierarchical position. The hierarchical information which is stored with each taxon will be linked to a separate taxonomic tree which will be maintained by BIOSIS and will be available for users to look at. Lastly the computer will automatically assign it a unique registration, or TRF number. A change to any one of the elements in this set results in the creation of a new TRF number. The computer records of the old and new TRF numbers will be suitably flagged and linked and their data elements will be amended so as to record the historical association between the two entries.

The TRF will also provide for a set of 'core' data elements for each taxon. So far, based on our work with Zoological Record, 14 data elements have been identified as being of general taxonomic interest, such as synonyms, spelling variants, common names, geographical and geological ranges, and type specimen and locality. Although it is not necessary for these 'core' data elements to be completed before a new taxon is added to the file, every effort will be made to complete this information promptly. We propose to compile a list of supplementary data elements with the assistance of potential system users, for example, host/pest data, endangered species legislation, derivative chemicals, toxin antidotes, etc. We hope thus to expand the usefulness of the file to a broader audience and to ensure sufficient flexibility in the system to accommodate potential new directions in taxonomic research.

Data for the required, core, and supplementary data elements will be acquired in several ways. In addition to the notes which users will enter once the network is operational, BIOSIS plans to solicit the cooperation of selected organizations in building a base file making use of respected collections of systematics data which already exist in computer-readable form. In addition, a third type of computer-supported input is planned for the future; namely, the automatic identification and input of relevant systematics data directly from the BIOSIS and Zoological Record publication data bases. Other features which are planned for the system include batch output in such forms as computer listings and tapes (e.g. for subset listings on selected data elements or organism groups); a mechanism for producing photocomposed output. Although no current plans exist for producing printed publications from the TRF, this represents a potential output of the system.

Problems of standardization in the CAB database: Biological nomenclature with special reference to entomology

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Introduction

THE COMMONWEALTH AGRICULTURAL BUREAUX (CAB) is an organization comprising 14 Institutes and Bureaux, all but one of which are based in the UK. It includes the Commonwealth Institute of Entomology (CIE), of which the insect identification and taxonomic services are based in the British Museum (Natural History) and the documentary services nearby at 56 Queen's Gate, South Kensington.

The location of the CIE identification service in the Natural History Museum is crucial because the CIE taxonomists, who are called on to identify insect (or mite) specimens from any part of the world, need to have access to a major international insect collection, and that of the BM(NH), with over 20 million specimens, is unique in its range. The location nearby of the CIE documentary services is also apt because of the high concentration of major scientific, and especially biological, libraries in the area.

As regards documentary activities, one of our most important functions is that of producing the monthly abstract journal, *Review of Applied Entomology*. This is issued in two parts—Series A (Agricultural) and Series B (Medical and Veterinary)—the two together containing approximately 10,000 abstracts a year. These are two of the total output of over 40 abstract journals published by CAB as a whole, which cover, broadly speaking, all aspects of agriculture, but also include some non-agricultural subjects (as in the case of medical entomology, which is included in the *Review*, Series B). A coverage of this wide scope obviously involves reference to a very extensive range of living organisms, whose nomenclature has to be meticulously standardized if confusion is to be avoided, and this is especially true of entomology, a subject which embraces more species than all the rest of the animal kingdom together and one in which much of the detailed taxonomy is in a tentative and transitory state. Standardizing the names applied to insects in the wide range of biological literature abstracted at CIE is therefore a major task, which we nevertheless regard as essential because we should otherwise have references to one particular species appearing under different scientific names, and hence a user attempting to retrieve information on that species would be liable to miss some of the items dealing with it.

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Standardization of entomological names in CIE

The primary tool is the card index of species names that have occurred in the *Review of Applied Entomology* since it began publication in 1913. It now contains over 80,000 cards, with species names not only of insects but also of other arthropods (notably mites and ticks) falling within the province of the *Review*. 'Insects' will therefore be used in the broad sense to include these other arthropods in the remainder of this paper. Two assistants spend the greater part of their working time keeping the card index up to date and checking the names of the species occurring in the abstracts or in other manuscripts processed for publication in CIE; wherever appropriate the names in the MSS are corrected to the standardized form recorded in the card index. Popular insect names are not used in our abstracts, and in the occasional cases in which we abstract a publication that quotes only such a name, we attempt to provide a scientific name that is a valid equivalent. This may be a matter of some difficulty, demanding a specialized knowledge of local usage.

Up-dating of the card index is done by reference to taxonomic research publications (including revisions and catalogues) by reputable taxonomists, and often by consultation of our own taxonomists or their colleagues on the staff of the BM(NH); in this respect the proximity of CIE's documentary and taxonomic services is a valuable asset. Sometimes, of course, the expert who is in a position to supply the answer needed is located elsewhere, and an enquiry may be made by letter.

Entered on each species card is the name of the species and genus, together with the author of the species name. The standard abbreviation of the author's name (if any) is shown and the standard taxonomic practice is followed of placing the author's name in brackets if the genus in which the species is placed is not the one to which he originally assigned it. Any alternative genera in which the species may have been placed, or any alternative species names for the insect, are recorded on the card, and there are cross-reference cards under these alternative names. Also entered on each card is the order and family in which the insect is placed, information on the taxonomic authority for the validity of its name as cited, and the volumes of the *Review* in which the species has been quoted. In addition to the species card index just described, we also maintain an index of insect genera without species names attached, because changes in the nomenclature of an entire genus may not always be apparent from the changes recorded on the cards of individual species within that genus.

After the insect names appearing in CIE abstracts have been checked against the card index, names that are not in the preferred form are converted to that form, the alternative name used by the author being quoted in brackets after the preferred name. In the published subject indexes to abstracts appearing in the *Review*, all references to a particular species are entered under the preferred name, with cross references to this from any alternative names that have been quoted. In this way nomenclatural confusion is reduced, and full retrieval of all references to a particular species made possible.

Standardization of other entities in CIE

Although the standardization of insect names occupies more time than any other form of checking carried out in CIE, names of other organisms are also checked by reference to card indexes, and if necessary converted to the standardized form. Many of these other organisms are the special province of other CAB Institutes or Bureaux, and in such cases we aim to keep CIE usage in alignment with theirs.

Plants often occur in our abstracts as sources of food for the insects, and if they are familiar species of major economic importance e.g. rice, potato, we refer to them by generally accepted common names, ensuring that the name appears in standardized form; this form is indicated in the higher plant card index which, unlike that devoted to insects, includes common as well as scientific names. When the plant is less generally known, or there is the possibility of confusion in the use of a common name, we quote the standardized scientific name as well as any alternative names (common or scientific) used by the author of the item being abstracted, again having recourse to the card index to determine the standardized name. As with insect names, cross references from alternative names used by authors are given in the published indexes to the *Review*, so facilitating retrieval of references to plant species appearing in the literature under a variety of different names (some of them perhaps of limited local usage).

Since plants are not the primary field of specialization of CIE, the plant species cards include less taxonomic detail than the insect cards and this is also true of the card indexes devoted to other groups of organisms. Animals not included in the Insecta or other arthropod groups are dealt with in the same way as plants, common names being used for very familiar species such as common domestic animals, and scientific names for the remainder; as with plants, alternative names given by the author are also quoted in the abstracts and cross references given in the published indexes to them. In the case of microorganisms, which occur in our abstracts both as pathogens transmitted by insects and as pathogens of the insects themselves, a scientific name is quoted when available, standardization as usual being achieved with the help of a card index. We also keep a card index for standardization purposes at CIE of relevant chemical (mainly insecticide or acaricide) names. These occur fairly frequently in our abstracts, and are dealt with by using standardized common names whenever generally accepted ones are available. Sometimes only a proprietary name is available, and in this case the full systematic chemical name is given in the abstract, following the nomenclature of the American Chemical Society.

Standardization throughout CAB and as a guide to users

Coordination of the various systems of standardization used by the sundry Institutes and Bureaux that collectively make up CAB has become very necessary now that all the abstracts produced are not only published in individual journals covering particular subject areas, but fed into a common computerized data base.

Partly to facilitate such coordination, a CAB Abstracts Word List was published in 1978 which shows the form accepted in CAB for approximately 34,000 terms occuring fairly frequently in the indexes to the abstracts. These terms include the names of living organisms (about 6,000 being entomological), chemical names, and sundry descriptive terms. The Word List includes 'see' and 'see also' cross references, and is to be developed into a fuller hierarchically-organized CAB Thesaurus scheduled for production in 1981.

The danger of using a standard word list or thesaurus as a guide to the preferred scientific names of living organisms is, of course, that these names are liable to change in accordance with ever-continuing developments in taxonomy. Hence some of the names listed must inevitably be out of date, and, as already indicated, this is particularly true of entomological names due to the unstable state of much of the taxonomy in this area. To meet this difficulty, any word list should ideally be updated at frequent intervals, but failing this, users of the CAB abstract journals can find a useful guide to currently preferred names and other terms in the published indexes to these journals. In the case of the *Review of Applied Entomology*, the index included with each monthly part shows all primary entries (including all names of insects, other organisms and relevant chemicals quoted in the abstracts), but sub-entries are shown only in the full annual indexes issued separately. In both cases, however, cross references from alternative names quoted in the abstracts are given, and in effect these indexes constitute regularly up-dated lists of preferred terms. Since recent issues of the annual indexes to the *Review* contain over 80,000 entries, their value as a source of information of this kind can be substantial.

MeSH—the subject heading approach

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Paper presented at the Aslib Biological and Agricultural Sciences Group Meeting, British Museum (Natural History), London, 11 and 12 November 1980

SHOULD ONE USE natural language or a controlled vocabulary to handle the names of organisms appearing in the scientific literature? At first sight the use of natural language seems attractive. One can take names straight from the text of articles and use them as descriptors in an information retrieval system. The taxonomic information is then as specific as the text itself.

When one comes to retrieve information in this way, however, it soon becomes obvious that organisms are described in a variety of ways in the literature. Synonyms and vernacular forms of nomenclature are surprisingly common. For example, sheep may be named as Ovis aries but are just as frequently called ewes, rams, lambs, wethers or even hoggets. They may even be referred to as Merinos, Suffolks or by other breed names. Adjectival, singular and plural forms of names are used, and these can occur in many languages other than English or taxonomic Latin. Even taxonomic nomenclature itself and classification schemes are subject to change and revision. Free text searching using natural language thus poses many problems for comprehensive retrieval. Without some kind of structural classification scheme, the retrieval of classes or orders of organisms is practically impossible.

The use of a thesaurus of permissible descriptors enables one to bring the various forms of name together under a single heading for each species or genus. The descriptors can be arranged in hierarchies based on taxonomic principles, enabling one to search on groups of related descriptors. The disadvantages of a thesaurus come from the loss of flexibility to make rapid changes in the system, and in the compromise that must be made between the specificity of individual headings and the size of thesaurus needed to accommodate a particular level of specificity.

Medical Subject Headings (MeSH)

MeSH is the thesaurus of 16,000 descriptors used in indexing the biomedical literature for *Index Medicus* and MEDLARS (Medical Literature Analysis and Retrieval System). MeSH is revised each year to incorporate new headings as well as any deletions or changes in the form of existing headings. It is published in two parts. The first lists the headings in alphabetical order and includes cross references from related terms as well as synonyms. The second part is a classified arrangement of the headings into hierarchies, called the MeSH Tree Structures.

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In the Tree Structures, the headings are allocated to one or more of 15 categories: category A—anatomic headings, category B—organisms, C—diseases, and so on. Each category is further divided into subcategories: B1—invertebrates, B2—vertebrates, B3—bacteria, B4—viruses, B5—lower plants and B6—higher plants and plant products. Within each subcategory the headings are arranged hierarchically from the most general to the most specific. Seven levels of specificity are available. Figure 1 shows part of the arrangement of headings in category B1—invertebrates.

There are three points to note about this arrangement. First, that MeSH often uses English vernacular forms, for example, SPIDERS rather than the taxonomic form Araneae. MeSH prefers English to taxonomic Latin because most references to organisms in the biomedical literature are in this form. Second, although the arrangement is a classification of the organisms into groups and hierarchies based on taxonomy, at each level of specificity the arrangement is alphabetical rather than phylogenetic or structural. Taxonomic arrangements require a considerable knowledge of the structure and form of organisms which most users of MeSH do not possess. Alphabetical hierarchies are easier to scan and use. Third, from a taxonomist's point of view, there are gaps and distortions in the arrangements and hierarchies. This is because they reflect the frequency of appearance of concepts in the biomedical literature rather than a balanced taxonomic classification scheme. When indexing for MEDLARS, the most specific headings available in MeSH are used, based on what is discussed in the text of the article rather than the wording of the title.

INVERTEBRATES	**B1**
ANIMALS, LABORATORY	**B1.62**
ANNELIDA	**B1.91**
LEECHES	**B1.91.426**
OLIGOCHAETA	**B1.91.657**
POLYCHAETA	**B1.91.700**
ARTHROPODS	**B1.131**
ARACHNIDA	**B1.131.166**
ACARI	**B1.131.166.132**
MITES	**B1.131.166.132.419**
TROMBICULID MITES •	**B1.131.166.132.419.875**
SARCOPTES SCABIEI	**B1.131.166.132.658**
TICKS	**B1.131.166.132.832**
DERMACENTOR •	**B1.131.166.132.832.380**
SCORPIONS	**B1.131.166.661**
SPIDERS	**B1.131.166.803**
BLACK WIDOW SPIDER •	**B1.131.166.803.200**
CRUSTACEA	**B1.131.365**
ARTEMIA	**B1.131.365.60**
BARNACLES	**B1.131.365.124**
CRABS	**B1.131.365.256**
CRAYFISH	**B1.131.365.327**
DAPHNIA	**B1.131.365.405**
LOBSTERS	**B1.131.365.623**
SHRIMP	**B1.131.365.844**
HORSESHOE CRABS	**B1.131.450**

FIG. 1. *Part of the MeSH Tree Structures*

Co-ordinate indexing

MEDLARS uses a system of co-ordinate indexing. In the absence of a single pre-co-ordinated heading for a concept two or more headings may be used. For example, the bacterium causing legionnaires' disease, Legionella pneumophila, is at present indexed by the combination: BACTERIA + LEGIONNAIRES' DISEASE because no adequate single heading exists for the organism. For 1981, a new heading LEGIONELLA has been created for this new genus. One point that should be noted is that diseases caused by organisms are indexed as pre-co-ordinated disease headings and not under the causative organism unless this figures in the article in its own right. Examples of organism disease headings are HOOKWORM INFECTIONS, PICORNAVIRUS INFECTIONS and SALMONELLA FOOD POISONING.

Subheadings are frequently used to qualify main headings to indicate those aspects which are under discussion, for example, SHEEP/physiology. 76 subheadings are available in the system, of which 22 are permitted for use with the category B headings.

analysis (not B2)
anatomy & histology (not B3, 4)
blood (only B2)
classification
cerebrospinal fluid (only B2)
cytology (not B2, 4)
drug effects (not B2)
embryology (not B3, 4, 5)
enzymology (not B2)
genetics
growth & development
immunology
isolation & purification (not B2, 6)
metabolism
microbiology (only B1, 2, 6)
parasitology (only B1, 2, 6)
pathogenicity (not B2, 6)
physiology
radiation effects (not B2)
surgery (only B2)
ultrastructure (not B2)
urine (only B2)

FIG. 2. *Subheadings available to Category B*

The subheadings available to the different B subcategories are shown in Figure 2. Each main heading may be qualified with up to three different subheadings to indicate the aspects of the heading which are discussed in the article.

Implications for retrieval

Since material is stored under the most specific heading with regard to the content of the article, and the headings can be arranged in structured hierarchies, this must be kept in mind when searching the MEDLARS files. If I search MEDLARS with the heading ARTIODACTYLA I will retrieve only the citations labelled with this heading. That is, articles on the order Artiodactyla, and articles on specific animals such as bison, giraffe and hippopotamus which belong within the order but which do not have specific MeSH headings in their own right. These have been assigned to the broader heading as the best available. MeSH headings for specific Artiodactyla listed under ARTIODACTYLA in the Tree Structures, such as ANTELOPES, BUFFALOES etc, will not be searched. In order to retrieve all the headings under ARTIODACTYLA in the Tree Structures I must use the command: EXPLODE ARTIODACTYLA. All the specific headings as well as ARTIODACTYLA will then be retrieved. This facility allows greater flexibility in searching.

CARNIVORA
B2.649.147+
GEN; IM; when IM, only /anat /blood–csf–urine /class /embryol /genet /growth /immunol /metab /microbiol /parasitol /physiol /surg; in addition to the XU's below, tigers, panthers, cougars, leopards, jaguars, etc. go here; here also are wolves, jackals, hyenas, civets, coyotes, martens (includes badgers, MINK, OTTERS, SKUNKS, weasels & wolverines)
XU BEARS
XU CHEETAHS
XU FERRETS
XU LIONS
XU MONGOOSE
XU OTTERS
XU SKUNKS

CARNOSINE
D12.644.456.345.331
do not use /defic /physiol; /analogs NIM only
(75); was see under PEPTIDES 1963–66
search DIPEPTIDES 1967–74 & PEPTIDES 1966
see under DIPEPTIDES

CAROB FLOUR see GASTROINTESTINAL AGENTS
D19.316+

CAROTENE
D2.455.849.131.247 D11.557.261.206+

FIG. 3. *Annotated MeSH*

Authorities and reference works

The prime authority in indexing and retrieval is MeSH. Annotations in the Annotated MeSH give information about usage of terms, subheading restrictions, indexing rules and references to Technical Notes. Figure 3 shows some annotations to the heading CARNIVORA in Annotated MeSH.

The second authority is the MEDLARS Indexing Manual. Whereas Annotated MeSH gives information about specific headings, the Indexing Manual deals with general principles and the rules of indexing. It has sections dealing specifically with problems in each area related to the categories of MeSH headings.

Each year, a bibliography of sources used in establishing MeSH headings is listed in the introduction to the public MeSH. The list is divided into groups of reference works by MeSH categories. 17 references are given for category B. These are used in cases where there is difficulty in assigning the correct heading to an organism by direct reference to MeSH.

Bacteria

Bacteria not found in MeSH are looked for in the latest edition of Bergey's *Manual of Determinative Bacteriology.* To give examples, the bacterium Eberthella viscosa is not in MeSH but in Bergey is found to be a synonym for Actinobacillus equuli. The genus name ACTINOBACILLUS is available in MeSH, so Eberthella viscosa is indexed with this heading. The bacterium Chlorobium vibrioforme is not listed in MeSH. It is found to be a legitimate species name in Bergey, in the family

Chlorobiaceae, order Rhodospirillales. Chlorobiaceae is not a MeSH heading but RHODOSPIRILLALES is available. Chlorobium vibrioforme is therefore assigned to this broader heading. It should be noted that Rickettsia are included in category B3 with bacteria.

Viruses

The reference used for viruses is Andrewes, Pereira and Wildy, *Viruses of Vertebrates*, 4th ed. Viruses not listed in MeSH are checked here to determine the appropriate MeSH heading. For example, feline ataxia virus is found to be a synonym for the MeSH heading FELINE INFECTIOUS ENTERITIS VIRUS. Negishi virus has no specific MeSH heading and so is assigned to the broader heading ENCEPHALITIS VIRUSES, TICK-BORNE.

Invertebrates and Vertebrates

The literature of biomedicine is orientated to human health and disease. Most animals recorded in MEDLARS are (a) those used in animal experiments to study physiology, pharmacology, models of human disease and similar topics, (b) those animals involved as parasites or as vectors of human or veterinary disease, (c) animals of veterinary interest and (d) animal sources of tissues and substances e.g. hormones, enzymes or immunological products, where the animal source is of major significance in the article. Since common experimental animals and veterinary animals are usually referred to by English names, most animal names in MeSH are in the English vernacular form, although problems can arise where English names are applied loosely to different species or genera.

Plants

Lower plants (category B5) are arranged in a taxonomic fashion. For fungi without specific headings Ainsworth and Bisby's *Dictionary of the Fungi*, 6th edition, is used in combination with a Fungus Key (MEDLARS Technical Note Supplement) which gives instructions for all entries at the level of order and higher levels. For example, Helicodendron is found to belong to the class Hyphomycetes, which the Fungus Key assigns to the MeSH heading MONILIALES.

Higher plants appear in biomedical literature as foodstuffs, as the source of drugs, as herbal medicines, as commercial products, and as types of tissue in biochemical and biophysical studies. Since MeSH is a medical thesaurus rather than a botanical source book, plants are indexed from a medical viewpoint, and the classification of category B6 reflects this approach.

MeSH has many specific headings for plants of medical significance, for example, BELLADONNA, CANNABIS, DIGITALIS and EUCALYPTUS. Many food plants are also in MeSH, for example, BARLEY, BRASSICA, CACAO and CASSAVA. If a specific plant is not in MeSH, the terminology and approach of the author will determine whether it is assigned to PLANTS, EDIBLE or PLANTS, MEDICINAL.

Headings like FRUIT, VEGETABLES, GRASSES, TREES, GRAIN and CEREALS may also be used, depending on the authors use of these terms, but not taxonomic or botanical identification is carried out to assign plants to these headings in a systematic way. For example, the tomato is popularly used as a vegetable, despite its botanical identity as a fruit. Tomato as an item of food is therefore indexed as VEGETABLES. The use of tomato tissue in biochemical experiments would be indexed simply as PLANTS.

The level of specificity

There is an obvious relationship between the level of specificity of headings and the number required. Specific MeSH headings for each species of organism would give rise to unmanageable numbers of headings: the class Mammalia alone contains 4,500 species. Other classes and phyla are very much larger, for example Mollusca with approximately 100,000 species and Insecta with 700,000 species. A compromise has been reached on the basis of the frequency of appearance of named organisms in the biomedical literature: those species which occur frequently have their own MeSH headings. Those species or genera which are cited less frequently in the biomedical literature are grouped under broader headings.

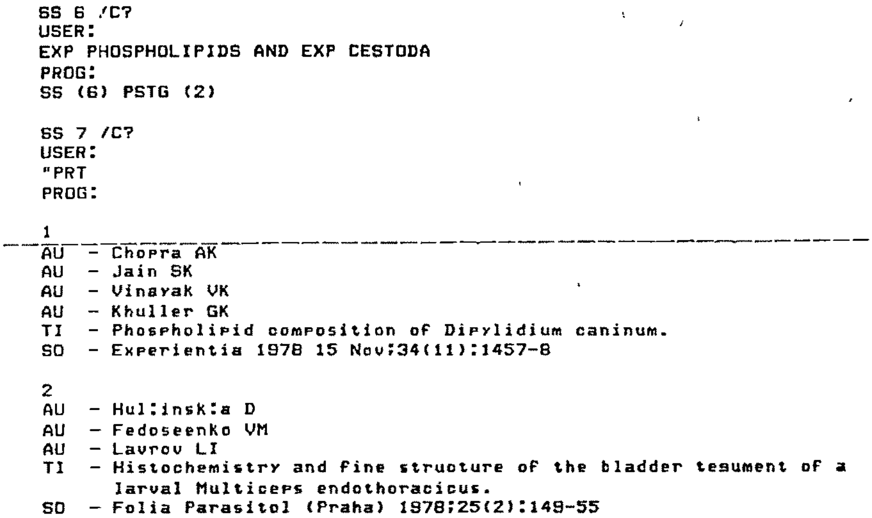
Textword searching

Users of MEDLINE have the facility to use textwords appearing in the titles or abstracts of citations as well as MeSH headings for retrieval. One does not have to opt for one or the other, but can use them separately or in combination to achieve the best effect. The following examples demonstrate the use of MeSH descriptors and textwords in various ways.

A search on MEDLINE using the textword 'Ovis' retrieved 112 citations. The textword 'sheep' retrieved 2,991 citations, but the MeSH heading SHEEP retrieved 4,507 citations. This demonstrates the ability of thesaurus headings to gather synonyms together for comprehensive retrieval.

MeSH does not have a specific heading for Pseudomonas putida. Articles on this bacterium are indexed under the broader heading, PSEUDOMONAS. In order to retrieve citations on the enzymes of Pseudomonas putida, a search was run using the main heading PSEUDOMONAS combined with the subheading 'enzymology' linked to the textword 'putida'. This retrieved 36 citations whereas the combination PSEUDOMONAS/enzymology alone retrieved 208 citations. The use of the textword thus improved the relevance of the retrieval to a considerable extent.

Specific retrieval using textwords alone is demonstrated by a MEDLINE search for articles on giraffes, for which there is no specific MeSH heading. The truncation 'all giraff: (tw)' was used to retrieve not only 'giraffe' and 'giraffes' but also the taxonomic form 'Giraffa'. However, it is worth noting that the use of truncated textwords in this way can create its own problems. The truncation 'all camel: (tw)' produces citations to 'camel', 'camelidae', 'camels' and 'Camelus' as one would expect, but it also gives citations to camellias, Camelot and camelpox! Fortunately, there is a MeSH heading CAMELS so one can avoid this particular problem.



```
SS 6 /C?
USER:
EXP PHOSPHOLIPIDS AND EXP CESTODA
PROG:
SS (6) PSTG (2)

SS 7 /C?
USER:
"PRT
PROG:

1
------------------------------------------------------------------------
AU  - Chopra AK
AU  - Jain SK
AU  - Vinayak VK
AU  - Khuller GK
TI  - Phospholipid composition of Dipylidium caninum.
SO  - Experientia 1978 15 Nov;34(11):1457-8

2
AU  - Hul:insk:a D
AU  - Fedoseenko VM
AU  - Lavrov LI
TI  - Histochemistry and fine struoture of the bladder tesument of a
      larval Multiceps endothoracicus.
SO  - Folia Parasitol (Praha) 1978;25(2):149-55
```

FIG. 4 *A MEDLINE Search*

Finally, the usefulness of the hierarchies of terms is demonstrated by a MEDLINE search for articles on phospholipids in Cestoda. MeSH has 13 more specific headings listed under CESTODA and a further 17 are listed under PHOSPHOLIPIDS. By using the EXPLODE facility we can retrieve any permutation of headings from the two groups. A search on this topic produced two citations which were retrieved and listed within a matter of seconds. How different from the time one would need to spend searching by hand in the library, or even in preparing lists of possible textwords and synonyms for use in a less structured system.

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Names of living organisms in a thesaurus on animal health and hygiene

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Paper presented at the Aslib Biological and Agricultural Sciences Group Meeting, British Museum (Natural History), London, 11 and 12 November 1980

THE LIBRARY OF the Ministry of Agriculture, Fisheries and Food at Tolworth serves the needs of the State Veterinary Service Headquarters & Field staff, and of the Animal Health Divisions of MAFF. The functions of the Government veterinary service include

(a) Control and eradication of notifiable animal disease and zoonoses.
(b) Health schemes and advisory work on livestock systems.
(c) Welfare.
(d) Meat hygiene; import and export control of livestock & meat.

In 1972, when the Index of Animal Health Literature was suggested, the comprehensive library of the Central Veterinary Laboratory and CAB's veterinary publications did not deal very fully with field and administrative aspects of animal health, and there were several relevant journals which they did not cover. Because disease control operations were directed from Tolworth, it was decided that the new index should be situated at Tolworth and the coverage by the Library there improved.

Standard library classifications were not adequate for the depth of indexing required. No local computer indexing facilities were available, so it was decided to use a post-coordinate indexing system, with a Thesaurus and 10,000 position optical-coincidence cards. This would allow scope for detail and also allow flexibility in use.

The precise subject scope of the library and the new index, that is the names of the diseases, animals, products and environments, was determined from the internal Division of Business Guide, and by consultation with veterinary staff. The intake of literature was reviewed to ensure that the Library was receiving all the relevant journals regularly. Enquiries made were monitored, to gain some idea of the depth of indexing likely to be required, and some idea of the particular aspects which would require emphasis.

It was decided that the thesaurus should be structured and specific; the only element of pre-coordination allowed was in the index, where some disease entities were ready-formulated to ensure consistency and reduce indexing time. We had to decide whether to index diseases as disease entities, or express them by bringing together the names of the diseased species, the name of the causative organism and terms like 'diseases'

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or 'parasitism'. The latter option was chosen, as it allowed greater flexibility, and would permit retrieval of papers written in either a biological or a pathological context. No logical operators were used, to keep down indexing time. Since we knew that sooner or later we would be using online services, it seemed sensible to make it easy to move from one system to the other, so it was decided to use the terms in CAB's Veterinary Subject Headings (Vesh) where possible.

The first parts of the Thesaurus to be compiled were the hierarchical schedules. Their logical arrangement was based on the ideas of B. C. Vickery and the Classification Research Group (Aitchison & Gilchrist, p. 33). The choice of terms was governed by veterinary and administrative responsibilities and the library's need to make a quick response to enquiries; the schedules reflect the specialized interests and local requirements of the library, and were not intended as an exhaustive classification of the subject. There were 10 schedules, some subdivided for convenience:

A. Substances and organisms
  1. Chemicals
  2. Viruses
  3. Bacteria
  4. Algae
  5. Plant Kingdom
  6. Animal Kingdom
  61. Protozoa
  62. Invertebrates
  63. Birds
  64. Mammals

B. Parts and constituents of organisms

C. Environments

D. Products

E. Processes of operation
  1. Physiology
  2. Disease & disease control
  3. Production processes

F. Equipment

G. General properties

H. Place names

J. Time factors

K. Points of view; organizations; formats.

FIG 1. *List of hierarchical schedules*

A draft list of indexing terms was drawn up, one term to a card to facilitate sorting. Terms were taken from Vesh, some internal ADAS thesauri, and various reference books. It was at this point that we met difficulties with the names of living organisms. The dilemma was unexpectedly settled by a veterinary officer who when he heard what we were doing, said he hoped we would keep it simple as working 'in the field' he had become accustomed to country names and did not use the scientific ones a great deal. It was certainly true that most of our enquiries were phrased in the vernacular. We reconsidered the decision on using names of causative organisms rather than disease-names, and concluded that while we definitely needed the flexibility offered by using the names of organisms, we would use their best known common names where possible, and provide adequate cross references from synonyms; of course some organisms have no common name, and one can only use their Latin name. Suitable reference books were identified as authorities for names and carefully noted so that new terms could be checked for consistency. Some examples from the first hierarchical schedule follow:

A2 Viruses
Enterovirus
swine vesicular disease virus
Rhinovirus
fmd virus
A, Asia 1, C, O, SAT 1, SAT 2, SAT 3.

A3 Bacteria
(Eubacteriales)
Bacillus spp.
anthracis
cereus
subtilis

A5 Plant Kingdom
Fungi
Aspergillus spp.
(Higher plants)
bracken
grasses
legumes
root crops
trees & shrubs

A6 Animal Kingdom

A62 Invertebrates
Nematodes
Ascaris spp.
Gape worms (Syngamidae etc.)
Hook worm (Monodontius etc.)
Insects
biting midges (Culicoides spp.)
black flies (Simulium ornatum)
warble flies (Hypoderma spp.)

Fig 2. *Specimens entries from hierarchical schedules*

The result is a somewhat unusual but very practical mixture of Latin and common names, which matches the vocabulary of the literature quite well and keeps indexing difficulties to a minimum.

The drafts of the hierarchical schedules were sent to colleagues for checking and comment, and were revised in the light of their remarks. The schedules were then tested on a small sample of current papers, and proved easy to apply and effective in retrieval. The alphabetical index to the Thesaurus was then compiled: entries indicated the schedule to which terms belonged, gave the synonyms, the broader term under which the word was subsumed, and also indicated terms in other schedules which were relevant. For example:

Gad flies *use* Warble flies A62

Hypoderma spp. *use* Warble flies A62

Parasitism and symbiosis E1
  bt behaviour
  rt (substances and organisms A)

Repellants A1
  bt chemicals
  rt . . . insects A62

Warble flies A62
  use for: gad flies, Hypoderma spp.
  bt: insects
  rt: repellants A1, parasites & symbiosis E1

Fig 3. *Specimen entries from Alphabetical index*

When completed, there were 563 terms for use, and about 1100 entries in the alphabetical index; total preparation took nearly a year. It soon proved its worth, but inevitably there were a few minor snags. Some of the names we had to use were rather long, and could not be written clearly on the feature cards; one could only provide breakdown by type, breed, subspecies or whatever, when it was possible to abbreviate the generic and/or specific names. Frequently, it was sufficient to use the term 'types', from the general properties schedules.

It is encouraging to note that since this Thesaurus was compiled in 1973, several useful bibliographic and taxonomic works have been published; for example, the reference guides to animal identification just published by the BM(NH) and the ICSB's *Approved Lists of Bacterial Names*. These will do much to reduce difficulties in understanding and getting access to information experienced by non-specialists needing to use the best available nomenclature.

ACKNOWLEDGEMENTS

My thanks are due to colleagues who assisted in the construction and application of the thesaurus, especially Mr D. E. Gray, Miss J. M. Edwards and Mrs M. Brown,

and also to Mr F. C. Hirst and Mr R. M. Park for agreeing that I should present this paper.

This paper relates to a project carried out in my previous job during 1973–74, and is not at all connected with the work of RBG, Kew.

The classification of biological literature

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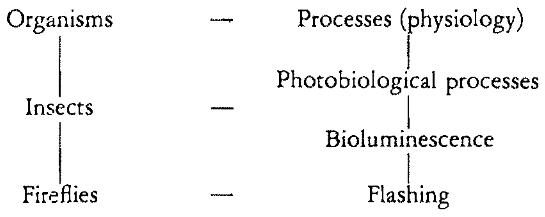
Paper presented at the Aslib Biological and Agricultural Sciences Group Meeting, British Museum (Natural History), London, 11 and 12 November 1980

TAXONOMY IN BIOLOGY is concerned with the definition of classes or organisms in the furtherance of our knowledge of these (whatever the ultimate purpose served by this knowledge). It uses systematic grouping as a prime instrument, since all definition implies classification (and vice-versa) and classification provides an orderly arrangement which facilitates the handling and comprehension of the vast body of data involved.

In library and information work, classification is an instrument of information retrieval—ie an aid to finding particular items in an information store. Such classification must concern itself with everything written about in the biological literature—not only with the recognised taxa but also other classes or organisms (eg herbivorous animals, parasitic organisms, cattle) and more extensively, the parts and properties, processes and interactions of organisms, the actions performed on these by man and the agents and instruments of these actions.

The central role of classification in retrieval is often inadequately recognised. All retrieval from a store of information consists essentially of a series of classificatory acts, from the original categorization of a subject request to its eventual matching or partial matching with a number of differently defined document subsets. Such are the vagaries of authorship and information-packaging that relevant items may be found in classes not corresponding exactly in definition to the original search prescription. For example, a search in a particular limited file for information on flashing in fireflies could be characterized as a search for the class of documenta dealing with the biophysical process 'flashing' in the particular family known as fireflies; but the relevant information might be found, say, in a paper on insect bioluminescence.

The search pathways necessary to move from the original search prescription to the particular related one given can be shown diagrammatically:



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A compound class like the flashing of fireflies would be represented by a simple syntactical string (Fireflies—Flashing) on the horizontal axis. The hieratchical level of each component term to the string should be adjustable independently, to arrive, say, at Insects—Bioluminescence and we have hypothesized the retrieval of a relevant document from this broader class. Such situations constantly arise and this holds some obvious implications for anybody designing a controlled index language. The chief one is that the index language, whatever its format and at whatever point in the total search operation it is invoked, must allow for the adjustment of a search to different levels in any given hierarchy and to different degrees and types of syntactical relationships between concepts derived from different hierarchies.

The central feature of an index language for pre-coordinate indexing is its need to produce a one-dimensional, linear order of all its classes. Its exigencies are partly sidestepped by the use in catalogues and bibliographies of multiple entry. But sidestepping is not possible in the purest form of the linear index which is the systematic arrangement of the documents themselves, physically. The retrieval power of a search is a function of (1) accuracy of the search prescription and of (2) the index descriptions, (3) the degree of awareness of the searcher, and (4) the predictability of the 'index language' in locating any particular class of information. It is with (4) that the rest of this paper is concerned.

Comprehensive rules for the design of a special classification (ie one restricted to a reasonably well defined subject) were developed in the 1950s and 1960s, building on the foundations laid by S. R. Ranganathan. It is helpful to consider the basic rules as a series of procedures, to be taken in an invariant order, whereby the full vocabulary of the subject is organized in a linear sequence so that any given class, simple or compound, has one and only one location. That this restriction can be compensated for to a large degree in catalogues and indexes is disregarded here.

The basic design steps are as follows:

The terms constituting the vocabulary of biology are organized initially into broad facets, so that terms representing concepts which stand in the same broad relationship to the containing class are found in the same facet.

The major facets in biology are:
Organisms (Plants . . . Leguminosae . . . Estuarine animals . . . Maritime plants . . .)
Parts (Roots . . . Stems . . . Trunks . . . Limbs . . . Nerves . . . Arteries . . .)
Processes (Homeostasis . . . Metabolism . . . Digestion . . . Evolution . . .)
Environments and external interactions (Aquatic . . . Autecology . . . Behaviour . . .)
*Operations, actions on organisms (Study . . . Experiment . . . Breeding . . . Diagnosis)
Agents and instruments of the processes and operations (buildings, equipment, personnel . . .).
Properties (of any of the above concepts, if necessary).

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*In the sciences, one of the classes Operations generates is Application. This class, in the form of a particular technology, generates in turn a complete new set of relations for the categories in the 'pure' science (eg the organisms in Biology tend to become the 'products' in Applied biology).

Within each broad facet terms are organized further into sets (called 'arrays') reflecting specific principles of division. For example, organisms may be divided by structure, phylogenetic relationships, age, sex, habitat, dietary habits, etc. Ideally, at this stage of analysis, the classes established within an array are mutually exclusive. At least, this holds at the first level or step of division. But if any of the classes is then divided further according to characteristics peculiar to it, the classes within the hierarchy so formed are not, of course, mutually exclusive. The most prominent examples of such hierarchies are of course the great taxonomies themselves and the documentary classifier simply borrows these *en bloc.*

The citation order is now decided. It determines which concepts are sub-ordinated to others and are therefore scattered to varying degrees in the linear sequence; eg if in the Medicine class, inguinal hernia is sub-ordinated to inguinal region, this implies that the literature on hernias is scattered accordingly to the part of the body affected. Viewed as a sequence of elements in the syntactic string formed by a single index description it is reflected by the 'combination' order—ie Inguinal region—Hernia. A string of this kind, in which two or more concepts appear, derived from different arrays or facets, is called a compound class. The significance of the compound class (and the index-descriptions of the vast majority of documents are compound classes) is that it raises the problem of citation order—the central problem of documentary classification and the main determinant of the final order of classes.

Rules are essential, for citation order (a) between facets and (b) between arrays. For (a) the 'standard' citation order (c.f. Ranganathan's Colon Classification) is the formula frequently adopted. Two prominent examples of fully faceted general classifications—the Bliss Bibliographic Classification, Edition 2[1] and the Broad System of Ordering[2] follow this principle. Put rather crudely, the primary (first-cited) facet is that which reflects the ultimate purpose or object of study in a subject. Having decided this, the rest of the order is almost mechanically determined by the invariant sequence: types, parts, processes, actions on systems, agents. Properties of anything are subordinated to that thing, whatever category it belongs to (type, process, etc.). In Biology, the primary facet by this principle is the Organism, which constitutes the ultimate system to which all the other categories refer. (b) No generally accepted principles have yet been developed to guide the choice of citation order between arrays. The rules are largely empirical, designed to cite more 'significant' characteristics before less significant ones; eg in the Organisms facet in Biology there is no argument about the taxa constituting the primary facet. But in many cases the choice is entirely pragmatic.

The filing order is the order in which the separate classes, simple or compound, follow each other in the systematic sequence (as distinct from citation order, which refers to the order of elements in a single compound index description). It has two separate components; for (i), the order between the different facets and arrays it is usual (but not essential) to have an 'inverted' order—ie the primary facet files last, the secondary facet files next to last and so on. For example, in the following sequence (assuming a citation order: Organism—Process):

Photosynthesis
Chlamydomonas reinhardi
Photosynthesis in *Chlamydomonas reinhardi*

the general class Photosynthesis and the general class *Chlamydomonas reinhardi* both file before the more specific class Photosynthesis in *Chlamydomonas reinhardi.* Arrays within each facet are similarly 'inverted'. (ii) The order of the mutually exclusive classes within an array ('order in array') should be based on a helpful systematic principle if one is available (eg chronological order of occurrence in a sequence of operations or events).

The rules of citation order and filing order together determine the relative position of every class in the systematic order. To make the maintenance of this order viable in a practical sense (eg maintaining the order of documents on a shelf or of entries in a catalogue) a notation is required whereby every class, simple or compound, is represented in practice by a classmark consisting of ordinal symbols (numbers and/or letters usually). Modern notations restrict themselves to showing the relative position of each class with a symbol of maximum simplicity and brevity, and do not attempt to express the hierarchical and/or syntactical relations between classes. Secondly, they are synthetic, or faceted. So notation is assigned in the schedules only to the 'simple' classes within the different facets and rules are provided whereby the indexer can build composite classmarks from these components to represent compound classes.

The last step in the design process is the provision of an A/Z index to the classification. The crucial problem here is how to provide maximum access from all sought keywords without enormous inflation of the A/Z index, which can occur with compound classes of unexceptional complexity. A relatively simple solution is found in chain indexing, a form of symbiosis between the systematic and alphabetic forms of indication.

Implementing the design rules above would produce a classification of biology something like this in outline:

Biology
  (Operations and their agents) Research, practical and experimental biology
    Personnel . . . Equipment . . .
  (Processes) Physiology: biophysics, biochemistry . . . development . . . genetics . . . evolution
  (Environments and interaction) Ecology . . . behaviour
  (Parts of organisms) Anatomy
    Microstructures: cells . . . tissues
    Macrostructures: functional systems (respiratory . . . circulatory . . .)
  (Types of organisms)
    By 'non-taxonomic' characters (aquatic . . . saprophytic . . .)
    Microorganisms . . . Plants . . . Animals . . . Homo sapiens . . .

Compound class would be built by a retroactive process, to give, for example a string such as: Honey bee—Compound eye—Photoreceptors—Low frequency radiation—Staining.

Editor's note. Space does not allow for the discussion here of the following aspects which are available in the full paper. These include applications of the rules of logical division; faceted classification as a monothetic (monotypic) system compared with a more 'natural' classification of polythetic (polytypic) groups, which bring together members having a greater number of shared features (c.f. numerical taxonomy);

'Summarization' (terms which taken together as a syntactical string sum up the overall theme of the document indexed; added entries; comparison of classified indexing with coordinate indexing).

As one moves from broad outlines to the fine structure of the detailed vocabulary a scale effect becomes apparent and the basic rules must be supplemented. One example of this is the 'specifier'; this refers to the appearance in a 'Type' facet of a term from another category (a property, a process, a part, say) used to define a type. For example, a string such as 'Laboratory animals—Anaesthesis' reflects the analysis: Organism—Action, whereas 'Laboratory animals—Anaesthetized' reflects the analysis: Organism—Types (by action performed). The second string would file separately from the first, despite their close relationship. Such separation is preferred when the compound notion is itself treated as an entity and further qualified, eg catheterization of anaesthetized laboratory animals. Another example is the modification or expansion of a facet (i) to qualify classes further down in the (inverted) schedule, eg the Parts of organisms. As a general class, this hardly exists in general biology. On the other hand, despite the wide variations in structure between different kinds of animals a basic Parts facet can still provide to a surprising degree the concepts necessary to specify structural features of different taxa. Or (ii) where differences in the relations between terms are revealed, eg the Processes facet some processes refer to the individual organism and others to the species, whilst some imply a micro-level of structure and others a macro-level.

Obviously, biology draws in varying degrees on all the other natural sciences. In virtually all cases the compounded class (biophysics, biochemistry, etc.) is subordinated to Biology as all the other sciences precede biology in the linear order. The interaction of biology with some at least of these other sciences is profound and goes far beyond a need to 'borrow' a concept occasionally to show its application in biology. For biochemistry and biological and medical technology for example, almost the full range of chemical concepts and substances needs to be available. In this respect it is an advantage to use the biology class in a general classification.

The principle of purpose suggests that the technology derived from the application of a science should be separated from it and follow it in filing order. The relations between the two are close in the case of biology (and even closer in the case of human biology and medicine) and ideally, in a general classification the application should follow immediately after the science. Structurally the technology class will be very similar to the science if the rules suggested in Section 2 are observed; but a number of significant adjustments are needed. The primacy of 'end-product' in the standard citation order leads to adjustments at the end of the schedule, as can be seen from Appendix I; eg under Animal husbandry the organism (the specific animal *per se*) is not the final array, which is the final product form. A major adjustment found in the applied science is the great expansion which normally takes place in the Operations and Agents facet and this is also very apparent from the outline in the Appendix.

Classifications are designed to serve particular purposes and even if the purpose is enduring the circumstances determining how it is served may change drastically. Ideally, a classification should change continually in response to altered needs. But the problem here is similar to that facing taxonomists who are well aware of the imperfections of their existing systems but who find the practical problems attending wholesale changes very daunting. However, modern faceted classification holds out considerably more promise in the matter of adaptability than the older system of bibliographic classification. Conceptually, their basis in facets and arrays is very stable and however headlong the growth of knowledge it would be difficult to find new concepts which are not definable ultimately in terms of facets and arrays. In notation too, purely ordinal notation can adjust more easily than hierarchical ones. Meanwhile, another sort of adjustability is that effected by the provision of alternative arrangements in a classification, so that a library with special requirements as to the order of classes has some choice in the matter. All such alternatives can be expressed in terms of citation order and filing order and again the presence of a clear and consistent structure makes the problem easier to see and to resolve.

(Abstract prepared by Ann Lumley, Centre for Overseas Pest Research)

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APPENDIX 1

Outline of a classification of Biology in context of a general classification

*Every class may be qualified by classes appearing earlier in the schedule—eg Dog-Digestive system—Mucosa—Cells—Proliferation

Methods of enquiry, research . . . Data processing . . .
Logic . . . Mathematics . . . Statistics . . .
Physics . . . Chemistry . . . Astronomy . . . Earth sciences . . . Ecology

BIOLOGY
  (Research, etc.) Experimental and practical biology . . . fieldwork Equipment, instrumentation
  Physiology (general) : biophysics . . . biochemistry . . .
    Pathology
  Anatomy (general)
  Microsystems : cellular and subcellular biology
    Cytology . . . Histology . . .
  Macrosystems : regions . . . organography . . .
  Development : ontogeny . . . embryology . . .

  Genetics, heredity, variation
  Evolution
    (Palaeontology in biology)
  Ecology
    (Processes) Autoecology . . . synecology . . .
    (Environments) Terrestrial . . . aquatic . . .
    Behaviour

*From draft of Classes E/F in Bliss Bibliographic Classification, ed.2 (BC2)

- (Organisms)
  - Distribution : biogeography, chorology . . .
  - Microbiology
  - Botany
  - Zoology
    - Primates (for Homo sapiens, see Anthropology)

- Applied biology, economic biology
  - Agriculture : plant and animal husbandry
    - Farm management
    - (Plants)
      - Crop production . . . soil management . . . sowing . . . harvesting . . .
      - (Forms of products) Field crops . . .
        - Field crop products
        - Horticulture
      - Specific plants
      - Forestry
    - Animal husbandry
      - Protection . . . breeding . . . feeding . . . handling . . .
      - Veterinary science
      - Specific animals
      - Animal products : dairy products . . . meat . . . skins . . .
  - Wild life exploitation
      - Culture
      - Hunting and fishing

- Anthropology, Biomedical sciences
  - Human biology and physical anthropology
  - Health sciences, Medical sciences
    - Health services and personnel
    - Technical procedures and medical technology
    - Preventive medicine
    - Curative medicine
      - Clinical medicine: investigation and diagnosis . . . treatment
    - Diseases and pathology
    - Parts, organs and systems of the body
    - Type of persons

The UDC and a botanical collection with special reference to the Botanical Library, British Museum (Natural History)

P. I. Edwards

Paper presented at the Aslib Biological and Agricultural Sciences Group Meeting, British Museum (Natural History), London, 11 and 12 November 1980

THE CHOICE OF a classification scheme is never entirely objective. One's past acquaintance with one or more of the major schemes, while training as a librarian, and/or in a work situation must have some influence on one's final decision. Before embarking on classing a library collection one should consider the relative merits of the various major schemes in relation to your user's requirements.

The major classification schemes to which I shall be referring are the following:

Melvil Dewey's *Decimal Classification* (DC)
Library of Congress Classification (LC)
Bliss *System of Bibliographic Classification* (BC)
Universal Decimal Classification (UDC)

There is a difference in these schemes in the arrangement of the main subdivisions in the botanical class and also in facets included within the schedule.

At this meeting we are especially concerned with the classing of taxonomic literature. Today such literature ramifies into most other areas of botanical science—genetics, cytology, plant chemistry, anatomy, morphology, development, etc. The ability to indicate relationship between the taxonomic aspect and other aspects is therefore of prime importance. So too is the facility of alternative placing which enables a classification scheme to meet the different requirement of users.

The Library of Congress scheme (LC), was formulated with little regard to its use by other libraries in contrast to the Dewey Scheme (DC) which its originator hoped would be widely adopted and used. Both of these schemes were designed to class a collection of books. LC's notation is a mixture of capital letters and arabic numerals. Each major class is entirely selfcontained. All aspects of the subject must be located within that class. Expansion of the schedule is by the use of decimals and by the addition of lower case letter or letters. This gives great elasticity but often leads to a long number.

There are a number of schemes for the classification of the plant world, all are naturally hierachical. It is unfortunate that there is today no authoritative and standardised system for Systematic Botany. Taxonomic literature moreover extends back in time, when there were other arrangements of the plant world. These other groupings of orders and genera have to be filed into systematic schedules, based on

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twentieth century opinions, as do works using obsolete terms and terminology having a completely different meaning today.

LC rather than choose one of the plant classification schemes merely subdivides A-Z by family and genus for flowering plants (Phanerogams) and A–Z by families for non-flowering plants (Cryptogams). This arrangement in the flowering plants separate genera from their family. In the latest, 1973, edition of LC the arrangement has been changed to A–Z of families. LC does not provide a means of showing relationship between one or more facets of a subject e.g. Anatomy of the Compositae. Subjects such as these have to be given a specific location in the schedule e.g. Anatomy and histology of individual groups A–Z (QK 683); by specific parts (QK 684). There is also no provision for indicating a geographical facet, important in taxonomic literature. Double entry under the flora number is, of course, possible. LC is thus not suitable for classing taxonomic literature and highly specialized literature. A number of American botanical libraries however use LC, some because they have wanted to purchase LC catalogue cards and more recently participate in co-operative cataloguing schemes such as OCLC. There is one special collection of taxonomic literature for which LC provides a location (QK 91)—the works of the great Swedish botanist Carl Linneaus. This is a collection which should be kept together and which has to be arranged in some logical sequence.

LC schedules are constantly under revision, class by class. The last revision of Class Q, Science was in 1973.

In the System of Bibliographic Classification of Henry E. Bliss (BC) the notation consists of upper, and lower case letters and arabic numerals. It has considerable brevity, e.g. Botany F. BC includes Bacteriology, Applied mycology Botany and Pathology among its main sub-divisions. This would be an important feature when classing some botanical collections. In the systematic schedules BC includes the fossil aspect of those groups where it is relevant. Palaeontology (FJ) is also included as a main subdivision. The flowering plant arrangement is hierarchical. The orders and families (FL) are those given in Engler and Prantl's *Syllabus der Pflanzenfamilien* as adapted by Rendle, Wettstein and Strasburger. To these families and genera have been added the more important ones given in the schemes of Bentham & Hooker, Hutchinson, Bessey, Small, Britten, Gray, etc. This is thus the most detailed and useful schedule of the four schemes. The non-flowering plants are only subdivided into class and order e.g.

FLN Phaeophyceae
  e Phaeosporales
  h Dictyotales
  l Lammariales
  f Fucales

Form divisions numbered one to six, can be used throughout the schedules of the Auxilliary schedules; number two enables morphological aspects of systematic groups to be indicated. There are also ten systematic schedules; number two enables the geographical aspect to be shown.

The Form divisions, Auxilliary and Systematic schedules make BC a possible scheme for the classing of a botanical collection, though some amendment and obvious expansion of the Cryptogamic section would be necessary. Some botanical libraries in the U.S.A. use it. One library in the U.K. that does so is that of the Royal Botanic Garden, Edinburgh where the Librarian and staff have mixed opinions as to its effectiveness. A great drawback in the past to the wider use of BC is no doubt the lack of a revision of the whole schedules. An organization responsible for the updating of the schedules was formed in 1967. Butterworths, in 1977 published Ed. 2, *Introduction and Auxilliary schedules*, edited by J. Mills and V. Broughton.

Dewey with his Decimal Classification attempted to formulate a scheme of the 'greatest possible simplicity' and one which would 'with its ease of application, its expansibility, and its universal appeal, be adopted in most libraries, thus giving the uniformity which seemed essential'. DC is used in all Public Libraries in the U.K., and is, in fact, widely used in all English speaking countries and has been translated into most European languages and into Chinese and Japanese. It is essentially a book classification. In the design of the schedules practical usefulness has been given prior consideration. The scientific schedules have been formulated according to the scientists own classification of their particular field of knowledge. Letters of the alphabet, though giving a much longer base for the notation did not meet Dewey's aim of universal appeal. An arabic number notation was the only international language that could be used. Further it is considered that an all number notation is easier for the user. The arabic numbers are used decimally, with a three figure minimum. The notation is infinitely expansible, any division after the three figures is accommodated by the use of the digits 1–9 after a decimal point. There are nine common form divisions whose numbers may be added to any number in the schedules. Geographical numbers are taken from the topographical arrangement in History 900. Only the numbers following the initial 9 are added. With the 13th edition of DC Table 2 of the Appendices gave a selection of the common viewpoints, forms, and subdivisions of the UDC schedules which could be used at any head as required. Dewey has devices to show when two subjects are covered—a plus + sign; when an aspect of a subject a hyphen '-'; and when subjects are in relation to each other—a colon ':'. The flowering plant section 583.5 of the systematic schedules is detailed being based on the families and genera given in J. Hutchinson's *Families of Flowering plants*, 1926–34. The Cryptoganic section is merely divided into orders e.g.

588 Bryophyta
 .1 Sphagnales
 .2 Musci
 .3 Hepaticae
 .32 Aupherocerotales
 .4 Charales

Perhaps the most important factor contributing to DC success is the ease with which it can be modified to suit the needs of a particular library's users. DC is continually being revised by teams of specialists. The most recent edition, the 19th, 1980 was published by the Lake Placid Educational Foundation in 1980. DC's assurance of permanance provides a stability without which any library classification scheme is severely handicapped.

The Institut International de Bruxelles (Institut International de Documentation) main aim was the compilation of a complete card catalogue in both author and classified form of all existing literature. A very detailed classification scheme was obviously required. The Institut decided to use Dewey and obtained permission from its originator to alter and modify it provided the first three digits represented the same concept. The three figure minimum was abandoned and the decimal point was only used to break up numbers. The relationship signs, +; − & : serve the same purpose as in Dewey. Geographical numbers are taken from a special geographical schedule and are given within brackets e.g. Flora of England 581.9 (410). The nine form divisions (01)-(09) are also given within brackets and can be applied throughout the Botany schedule.

Why did I choose UDC? LC was obviously a non-starter as an effective classification for a highly specialised botanical collection and for the classing of analyticals. Except for the flowering plant schedule BC had not the detail required and its updating was at the time doubtful. The selection of UDC rather than DC was the very much greater detail given, in the full edition of UDC—the abridged edition being more equivalent to DC. The fuller schedules provide greater flexibility in indexing complex subjects. The notation for the subject of some books can however be very long and so detract from users filing them back in correct order on the shelves. It would however only be a worthwhile option to those familiar with the literature.

Most libraries treat their periodical stock as a separate entity and not as part of their classified sequence. LC and Bliss do however provide a location in their schedules for periodicals; DC and UDC do not do so. The major decision related to the arrangement of the taxonomic literature. The UDC followed the classification of Engler and Diels *Syllabus der Pflanzenfamilien* 11th ed. 1936. The arranging of the flowering plant herbarium in the British Museum (Natural History) is according to the older system, with certain modifications, of Bentham & Hooker. I decided I would substitute the Bentham & Hooker system for that of Engler and Diels. The Federation International de Documentation in Brussels, had no objection to this alteration provided I indicated this personal amendment, I used a lower case 'p' as the symbol. The UDC could consider, in a future revision, following BC and include the families and genera of a number of other systems of plant classification. A few changes were made to the Cryptogamic schedules. These particular schedules are very out of date and urgently require major revision. A classification of the ferns has been 'internationally' agreed and similar classifications for the other cryptogamic groups could I feel sure be formulated. Amendment to the geographical numbers was also necessary, Alaska could not remain next to Mexico! Phytogeographical boundaries do not always coincide with political ones, Malaysia (595) extending to a part of New Guinea and including all of Indonesia. The inclusion of Vice-counties in the geographical schedules is an important feature, as this is the U.K. system for recording plants. Another major decision concerned monographs of a family or genus from a particular region. Should they be filed with the floras of the region or with the monographs. The Keeper of the Department had to decide as opinion differed among the scientific staff—the decision, with the floras. This did not apply to monographs of British genera as the British Herbarium is arranged according to J. E. Dandy's *List*. These monographs were given the family number followed by Dandy's *List* number. The Genetics, Cytology and Biochemistry, 57 schedules have been extensively revised and published as BS 1000

(57) in 1979 which enables the new research areas in taxonomy to be more satisfactorily classed. An advantage in using UDC is this continual up-dating of the schedules even if no major revision in some areas has yet been attempted. Revision is undertaken by two organisations. Users of the English language edition send amendments and additions to the British Standards Institution who forward them to the Central Classification Committee of the F.I.D. in Brussels. They issue those which they approve in P Notes. From time to time BSI collate the data in these P Notes, and then send a draft revised schedule to known users of the English language edition for comment. These comments are then discussed by a BSI Committee who finalise the revision of the schedule. Only the general botany section of the 1979 botanical schedules BS 1000 (58) shows some revision, mainly in terminology and by the inclusion of the numbers for related subjects and in small type those numbers that have been cancelled. The general lay-out of this edition is no improvement on the 1943 ed. For the classifiers ease of use it is hoped that the next edition will see a return to the 1943 format and type face.

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A classification for medical and veterinary libraries by C. C. Barnard

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THIS CLASSIFICATION WAS published as a second edition in 1955 by H. K. Lewis & Co. Ltd. The first edition (1936) was based on the library of the London School of Hygiene and Tropical Medicine; but, in preparation of the new edition, the author was aware that many other medical libraries were using the scheme and changes were introduced to accommodate the needs of other, more general, medical libraries (*see below*). A third edition is in preparation by the author of this paper; but this new edition will largely consist of additions and amendments and will not involve the extensive re-location of subjects which was necessary for the second edition.

The compilation of the scheme was based on literary warrant; that is to say, the author studied the existing literature in appropriate libraries as also catalogues such as the *Index-Catalogue of the Surgeon-General's Library [now National Library of Medicine]*. The author tested, and modified further, the second edition by re-classifying the World Health Organization library in Geneva. The original basis of the scheme could be summarized as 'diseases and conditions having a similar causation are usefully studied together and clinically treated together'. Hence the primary arrangement of subjects is aetiological;

A	GENERALIA.
B	NATURAL SCIENCES, including Anatomy and Physiology.
C	GENERAL MEDICINE.
D	HISTORY OF MEDICINE.
E	EPIDEMIOLOGY, MEDICAL STATISTICS AND MEDICAL GEOGRAPHY.
F	AETIOLOGY, DISEASES OF DOUBTFUL CAUSATION, AND EFFECTS OF PHYSICAL AGENTS.
G	TOXICOLOGY AND DISEASES OF CHEMICAL CAUSATION (Poisoning, Deficiency Diseases and Disorders of Metabolism).
H	IMMUNOLOGY AND INFECTIOUS DISEASES.
I	MYCOLOGY AND MYCOSES.
J	BACTERIOLOGY AND BACTERIAL DISEASES, including works on micro-organisms in general.
K	VIROLOGY AND VIRAL DISEASES, including Rickettsiae and Rickettsioses.
L	PARASITOLOGY.

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LA–LZ	PROTOZOOLOGY.
M	HELMINTHOLOGY.
N	MEDICAL ENTOMOLOGY, including other Arthropods of medical interest.
O	TRANSMISSION OF COMMUNICABLE DISEASES.
P	PATHOLOGY AND HAEMATOLOGY.
Q	DIAGNOSIS AND CLINICAL MEDICINE.
R	MATERIA MEDICA, PHARMACY AND THERAPEUTICS.
S	HYGIENE, PUBLIC HEALTH AND SOCIAL MEDICINE, including Hospitals.
T	MEDICAL JURISPRUDENCE.
U	SPECIALTIES OF MEDICINE.
V	SURGERY.
W	DENTISTRY (ODONTOLOGY AND STOMATOLOGY).
X	VETERINARY SCIENCE.
Y	AGRICULTURE (PLANT AND ANIMAL INDUSTRY).
Z	GEOGRAPHY, ANTHROPOLOGY AND SOCIOLOGY.

FIG 1. *Main classes*

Before coming to the biological bases of the classification, it may be appropriate to indicate two other devices used by the author in compilation of the second edition which are designed to help libraries [and readers] in differing libraries. Firstly, alternative placings were introduced; and the librarian applying the scheme to a book-stock must decide on the most appropriate placing of subject for the readers in his own library; and he must record his decision for obvious reasons, for example by deleting the alternative not to be used. Examples of alternative locations are mainly—but not exclusively—found in the classes not related to the causation of disease. A typical

SYNOPSIS

(Alternative Notation)		(Original Notation)
F	SPECIFIC DISEASES and their causative agents.	
FA–FB	Aetiology, Diseases of Doubtful Causation and Physical Agents.	F
FC	Toxicology and Diseases of Chemical Causation.	G
FD	Deficiency Diseases and Disorders of Metabolism.	GN
FE	Immunology.	H
FF	Infectious Diseases.	HW–HZ
FG	Mycology and Mycoses.	I
FH-FP	Bacteriology.	J
FQ-FV	Virology.	K
FW	Parasitology.	L
FWA–FX	Protozoology.	LA–LZ
FY	Helminthology.	M
FZ–FZP	Medical Entomology.	N
FZQ–FZZ	Transmission of Communicable Diseases.	O

FIG 2. *Alternative notations*

alternative for decision is Anthrax which may be placed with bacterial diseases, or in occupational medicine. The latter class itself has alternate placings as part of Public Health [or Community Health] or as a separate speciality of medicine.

Secondly, librarians have the choice of two notations. In the present context, it is sufficient to say that the array of classes, sub-classes, etc. does not change but only the value or emphasis of the notation is changed. In the original notation, the main classes F through O are assigned to the aetiology of disease i.e. fungi, bacteria, viruses, etc. In the alternative notation printed alongside, these classes have their notation compressed into a single class F; and remaining classes which are related to the specialities of medicine have their notation expanded into the available space.

In Fig. 2, the effect of the alternative notation on the emphasis of the main classes can be seen. In Fig. 3 (below) can be seen an excerpt from the schedules which combines both alternative notation and alternative placings.

The biological basis of the Barnard classification was derived from many authorities of the time, such as R. T. Leiper, C. M. Wenyon and [Sir] Graham Wilson; but always the practical nature of the scheme was paramount to the author; and in the first edition there were some juxtapositions of groups of organisms which had to be relocated in the light of new knowledge in the second edition. This latter (1955) included a list of some 300 changes of notation, but only few represent a considerable volume of published literature; and in a library such as that of the London School of Hygiene and Tropical Medicine the decision was taken that only current material needed to

FIM	JG	The Coccaceae.
		The Micrococcaceae. Genera *Micrococcus, Sarcina, Rhodococcus.*
FIN	JGB	Botryomycosis.
FIO	JGD	The Streptococcaceae. Genus *Leuconostoc.*
FIP	JGE	Pyogenic infections. Genus *Staphylococcus.*
FIPC	JGF	Pyaemia. *Alternative* **GYG**, PYG.
		Joint-ill in calves.
FIPG	JGG	Septicaemia. *Alternative* **GYG**, PYG.
FIPK	JGH	Cutaneous affections. Pyococcal dermatitis, boils, carbuncles, furuncles, etc. *Alternative* **TBP**, URBP.
FIQ	JGJ	Genus *Streptococcus.*
FIR	JGK	Mastititis in animals.
FIS	JGL	Strangles in horses.
FIT	JGM	Haemolytic streptococci.
FIU	JGN	Erysipelas. *Alternative* **TBT**, URBT.
FIV	JGP	Impetigo. *Alternative* **TBU**, URBU.
FIW	JGQ	Streptococcal (septic) sore throat.
FIX	JGR	Puerperal sepsis (fever). *Alternative* **UPS**, UWY.
FIZ	JGS	**Scarlet fever** (scarlatina, *Ger.* Scharlach).
FJ	JGT	**Rheumatism** and rheumatic affections in general.
		Rheumatoid arthritis (chronic rheumatism, chronic arthritis and osteoarthritis).
		Gout. See **FDX**, GX.

FIG 3. *Excerpt from the schedules*

be re-classified and that the class-marks of reserve stock could be regarded as shelf-marks only, without a necessity for re-classification. In the third edition, there has been found so far little need for re-location of groups of organisms or diseases; but the major exception has been for a number of years the classification of the viruses. As the virologists have discovered hundreds of new organisms of medical importance during the years since publication of the second edition, so the third edition has been held back.

However, literature which has been published—or can be expected to be published—remains the basis of the Barnard classification. In principle, places have been allocated to any subjects which have, or may be foreseen to have, a body of literature of interest to medical or veterinary practitioners or research workers; and consequentially the array of sub-classes within any class is not complete. Provision is made for literature which may be of interest in medical (or veterinary) practice or research. An example follows of part of Helminthic Diseases, where the printed entries are second edition; and italicised additions are third edition.

It will be seen that the primary arrangement is by medical, or veterinary, condition although diseases having a related causation are brought together. In the main tables, the names of genera and species of causative organisms are used only as signposts for the classifier.

A third device which is used is the *Index of Parasites*. This links the aetiological basis of the scheme with the practice of medicine or veterinary science (see Fig. 5).

The author has said, in the introduction to the second edition, 'so far as possible "valid" and "obsolete" names of genera and species are relegated to the *Index of Parasites* (with no distinction) to enable librarians to classify literature of any age'.

Finally, it should be said that eleven auxiliary schedules are provided for use in

FY. M. HELMINTHOLOGY

FY	M	Helminthology. · *JMQJ Blood helminths.* · *JMSL Intestinal helminths.* · *X Veterinery helminths.* · *Y Plant helminths* (*including* Economic Helminthology).
FYB	*MB*	*Platyhelminthes.*
FYC	MC	Trematodes (flukes). · *JMH* Skin invasion by larvae. Cystic flukes.
FYCA	*MCA*	*Monogenea.*
FYCB	*MCB*	*Digenea.*
FYCC	*MCC*	*Aspidobothria.*
		Distomiasis (due to hermaphrodite distomes):—
FYD	MD	Intestinal distomiasis.
FYE	ME	Pulmonary distomiasis: paragonimiasis.
FYF	MF	Hepatic and pancreatic distomiasis: fascioliasis, opisthorchiasis.
FYG	MG	Amphistome infections.
FYH	MH	Schistosomiasis (bilharziasis) (due to unisexual distomes). Blood flukes.

FIG 4.

Sarcocystis, FXHS, LHS
Sarcophaga, FZN, NV
Sarcoptes, FZFJ, NGI
Savoia, FVY, KY
Scedosporium, FGC, IC
  apiospermum, FGD, ID
Scelus marmorans, FSP, KIP
  recurrens, FSR, KJB
  suillum, FSV, KJX
  tertium, FSU, KJR
Schistosoma (Schistosomum), FYH, MH
Schistosomatium, FYH, MH
Schizosaccharomyces, FGM, IM
Schizotrypanum, FXP, LP
Schöngastia, FZFG, NGC
Schottmüller's bacillus, FMC, JSC
Sclerostoma (Sclerostomum), FYRS, MRS

FIG 5. *Index of parasites*

various parts of the scheme. The two most appropriate to mention here are Table 8 for sub-division under micro-organisms and parasites, and Table 2 for geographical distribution.

Taxonomy and the Science Reference Library Classification

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Paper presented at the Aslib Biological and Agricultural Sciences Group Meeting, British Museum (Natural History), London, 11 and 12 November 1980

THE SCIENCE REFERENCE LIBRARY Classification was developed during the middle of the 1960s as a scheme to arrange books on the shelves of a large open-access library integrating the whole of Science and Technology in a single collection. It is intended to help in the retrieval of information which is not indexed elsewhere, by abstracting and bibliographic services, and to make 'browsing' by the large number of readers (one-third, according to the National Libraries Committee report[1]) who enter the library without a specific reference in mind as fruitful as possible.

The development of the classification, from Wyndham Hulme's Patent Office Library Classification, and the philosophy behind it are outlined by its originator, A. Sandison, in a recent paper[2]. Neither here nor in other published accounts[3,4] is there more than passing mention of how systematic literature in biology is classed. The classing problems raised by taxonomic writings are little pursued in librarianship literature, presumably because of the semantic difficulty that leads people to assume that as animals and plants are already classified in biological terms, books about them will fit naturally into any library classification.

It is true that for descriptive botany and zoology the order of the schedules in a library classification will tend to follow that of scientific method. However, modern biological classification reflects the natural relationships of living things and is continually changing as a result of better understanding of their essential nature. A library classification, even an in-house scheme with its advantages of flexibility and rapid updating, cannot fully reflect these changes. The scheme must be used for classifying by staff who are unlikely to be taxonomists (even when they are qualified in biology) and for retrieval by readers who want information as quickly as possible. As M. N. Dadd said in the final report of the study *Standardisation of Biological Names*[5] 'The aim of this project is to provide an arbitrary standard for data retrieval purposes only, until these definitive studies [by taxonomists] are complete'—that is until the unforeseeable future when all living things have been described and all taxonomists agree and therefore became an extinct species.

Before discussing in more detail the treatment of systematic biology in the Science Reference Library (SRL) Classification, a brief general account is necessary. A book does not possess an Aristotelian 'essence'; all books contain clusters of topics and the complex relationships between books could be revealed by multidimensional analysis

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or by in-depth indexing by abstracting services but not by the linear arrangement of volumes on a shelf. Each book touches only two others, each class is bounded by just two more. A reader making a subject search in an open-access library will be directed by the library's subject index to a specific location. If there is little of direct interest there, the shelves on both sides will be scanned. Books in neighbouring classes should therefore be organized to give as high a probability as possible of containing related information. All librarians know that many users give up rather than return to service points for help. These considerations led to the fundamental arrangement of classes in the SRL Classification as a ribbon of subjects each merging with those on both sides, intermingling technologies with the associated basic sciences. Thus for biological subjects the ribbon is:

C 00	*LIFE SCIENCES: general*
CA 00	GEOGRAPHY
CB 00	NATURAL HISTORY (ie observational studies)
CF 00	PALAEONTOLOGY: general
CG 00	BIOLOGY (theoretical and experimental)
CP 00	BOTANY: general
CQ 00	PLANT ECOLOGY
CR 00	PLANT PHYSIOLOGY
CT 50	PLANT KINGDOM (anatomical, descriptive and taxonomic works)
DB 20	MICROBIOLOGY
DD 60	MICROBIOLOGICAL INDUSTRIES
DG 00	FORESTRY
DH 70	TIMBER INDUSTRIES
DK 00	AGRICULTURE AND ITS ASSOCIATED INDUSTRIES
DL 00	AGRICULTURE
DT 00	PLANT CULTURE
EB 00	ANIMAL HUSBANDRY; DOMESTICATED ANIMALS
EG 00	VETERINARY SCIENCE
EK 00	SKIN PRODUCT INDUSTRIES
EL 50	FISHERIES; FISHING INDUSTRIES
EP 00	ZOOLOGY: general
EQ 37	ANIMAL ECOLOGY
ER 00	PHYSIOLOGY: of animals
FE 00	COMPARATIVE ANIMAL BEHAVIOUR
FG 00	PSYCHOLOGY
FP 00	ANIMAL KINGDOM (anatomical, descriptive and taxonomic works)
GH 00	ANTHROPOLOGY
GL 00	HUMAN ANATOMY: HUMAN EMBRYOLOGY
GP 00	MEDICINE
HD 00	PHARMACY AND PHARMACOLOGY
HF 00	PUBLIC HEALTH; HYGIENE
HP 00	FOOD; FOOD INDUSTRIES

The one major biological subject missing from this part of the ribbon is biochemistry. This is a result of another basic tenet of the SRL Classification: classification should be by inherent subject, not intended readership. Biochemistry is therefore placed in a subordinate relationship to chemistry rather than biology. In a similar way statistics for biologists is classed with general statistical techniques in the mathematics schedules.

A third feature of the SRL scheme is the frequent provision of 'other' classes to cater for aspects of a subject not foreseen or little studied at the time the schedules were written. For example in the general breakdown for ornithology, this array appears:

GC 59	Birds: by habitat, general
GC 60	Ocean birds; Sea birds
GC 62	Birds of other habitats

This means that an account of the peculiarities of island bird populations would not be classified with the more general books at GC59 but along with other specific topics in the 'other' class. There is usually sufficient room for expansion in the notation to allow for the interpolation of another class for any of the 'other' topics which become the subject of particularly extensive study: thus GC61 could become 'Island birds', leaving GC62 for moorland and garden birds etc. Rather similar in effect, providing flexibility for the classification to follow literary warrant and reflect current thought and publishing patterns is the use of 'A–Z' classes' to separate books on a large number of closely related things: for example types of chemical, countries in Africa, breeds of cattle or genera of beetles. These have particular importance in the biological sciences and will be discussed in more detail later.

Returning to the Life Sciences classification ribbon, it is at once apparent that a book about grasses might appear in any of the first three subdivisions of Botany, or within Plant Culture if on fodder cultivation, Animal Husbandry if on fodder use or less obviously in Natural History (grassland ecology) or perhaps even Food (nutritive value). The most basic characteristics of living organisms, and those of greatest specificity, are expressed in the taxonomic approach. The location for the family Gramineae in the Plant Kingdom schedules is CW68(G1): might one reasonably expect to find all these different aspects of grasses classified there? Perhaps so if one followed the principle of 'class with intrinsic subject' to its logical end, and for a library whose primary function was to provide taxonomic literature to systematists this might be the best course. SRL collects the whole range of scientific and technological publications for an equally wide range of users, and the various possible approaches to any topic must be provided for in a classification for books on shelves. The preferred maximum number of books in a class at SRL is 20, though the exponential growth of writing on some subjects has made this almost impossible to maintain. So to return to the grasses, any book or periodical dealing with all aspects of the Gramineae would indeed be located at CW68(G1). A book on the ecology of plants and animals in grasslands will be found in the ecology classes at CE550, with an added subject entry to Gramineae if it also enumerates and describes in detail the various species found, an account of pasture management or grain crops in Plant Culture, DW22, or DW01 respectively, and so on. This should mean that the agriculturalist, taxonomist or ecologist will find the appropriate literature on the shelves in the sequences most usually used in the particular discipline, and abundant cross-references in the catalogues and index to point out different approaches to the search.

The classing of descriptive taxonomic subjects in the SRL Classification attempts both to follow the most generally accepted view of the relationships within the Animal and Plant Kingdoms and to provide sufficient flexibility to allow changes in systematic thinking to be accommodated with a minimum of reclassification. An effort is also made to provide a suitable level of specificity in the schedules. It would be inappropriate to set out a similar array of classes for each phylum in the Animal Kingdom; schedules of the length needed for the over 850,000 species of Arthropoda are most unlikely to be required for 1,500 species of Rotifera. It is not only the number of species in a group that determines the number of classes needed for its literature; the attractiveness of birds or butterflies compared with fish or beetles is a factor, as is economic importance. The lowest taxonomic rank given its own class is the genus; the complications of indexing to the species level are too great even for such a large library as SRL.

The general order of classes in the systematic areas and the preferred synonyms for various groups is based as in a number of other classification schemes such as the modification of Bliss used by the library of the Zoological Society of London[6] on a set of standard reference works. For the Animal Kingdom the authorities are L. H. Hyman's *The Invertebrates*, volumes 1–VI, 1940–1967[7] for most invertebrates, and Parker and Haswell's *Text Book of Zoology*, 7th edition, 1962,[8] for arthropods and chordates. These may be augmented for difficult groups; for example by G. G. Simpson's *Principles of classification and a classification of mammals*[9] for that group. Other authorities are cited in the schedules for flowering plants, ferns and fungi, bacteria are arranged following the 7th edition of *Bergey's Manual of Determinative Bacteriology*.[10] In the virology schedules there is only an empty authority box, no suitable candidate yet having been selected. In each case a specific edition has been chosen and more recent ones will not be used, so as to maintain consistency. For more general areas some provision may be made for alternative systems of biological classification.

The natural hierarchies of animal and plant groups as given in the chosen authorities can be easily used by most SRL readers, even when the systematists among them may feel some of the relationships expressed are no longer valid. Extending a search up the hierarchy to the next highest taxonomic rank or to the point where two arrays of equal standing meet also come naturally to the biologically trained reader. The inclusion of arrays classed by non-taxonomic criteria within the larger groups of animals and plants may need more explanation. Part of the schedules for the class Mollusca is given as an example:

FV00	MOLLUSCA; MALACOLOGY	
FV10	**Habits; Life history**	
FV17	**Conchology; Shells; Pearls: general**	
FV20	**Special types of molluscs**	
	cp. shell fisheries	*EM37*
	for Snails and Slugs as pests of crops.	*See EA53*

FV29	Useful molluscs; Harmful molluscs: general (see, mutatis mutandis, the note at FY48)	
	cp. Economic aspects of mollusca	*EP5*
	for Molluscan shell fisheries	*EM37*
FV30–41	**Molluscs of particular environments**: general (Prefer by taxon FW1–6)	
	for Shells of several environments	*See FV17*
FV41–49	**Mollusca: by Geographical region**: general (Prefer shells FV17, by taxon, FW1–6; or by environment FV31 with added entry here)	
	for Shells	*see FV17*
	Environmental types	*see FV30*
FV50–58	**Palaeontology; Fossil mollusca: general** (Prefer by taxon FW1–6)	
FV60	**Anatomy and Embryology; Anatomy: of mollusca**	
FV9	**Classification; Taxonomy; Keys: of mollusca**	
FW10–175	Cephalopoda: general: Life history; Habits	
FW20	Gastropoda	
FW29	Orders; Families; Genera; A–Z	
FW29(H1)	*Helix*	

This shows both strengths and weaknesses. A feature I consider a strength is the inclusion of molluscan palaeontology in the main systematic array. In many other classifications, Library of Congress[11] and Dewey[12] for example, there is a separate palaeontological taxonomy schedule, which cannot be helpful to the worker revising a genus including fossil and living material. The SRL Animal Palaeontology schedule is used only for books about a variety of fossil taxa and is arranged by geological eras. A weakness is the instruction to prefer the conchological class FV11 or the environmental classes FV30–FV35 over the regional array FV41–FV49, when these regional classes are more specific and are better related to the way books on molluscs are usually written. This is an area where some reclassification and redefinition of classes will be quite easy and should soon be done. Something which may prove more troublesome is the mixture of taxonomic ranks at the end of the Gastropoda section in the A–Z class.

The terms chosen for an A–Z class to provide the bracketed final letter of the notation must satisfy one of three criteria. First preference is given to a term already found in the schedules or index to the classification. Thus *Helix* appears in the schedule with its own location FW29(H1) and all works on *Helix pomatia* Linné 1758 for example would be classified here, though not those on the old Linnaean species of *Helix* such as *H.* (now *Cepea*) *nemoralis* which were referred to other genera many years ago. Secondly the nomenclature used in the standard reference work may by used. Thirdly, if the taxon is not found in either of these sources, and cannot be readily identified as a synonym of any term that is included in them, the author's own usage will provide the initial letter for the notation. Some synonyms may have cross references in the index, but others will not, either because the original classifier was not aware of them or because the synonymy is not exact. Another problem in some taxa such as Mollusca is the use of one A–Z sequence for several taxonomic ranks. The letter (P) is the suffix for works on orders (Prosobranchiata and Pulmonata), families (Pyramidellidae) and genera (*Patella*). As well as generic synonyms, the thorough searcher must be aware of all orders, families and sub-families that might have contained the genus.

Most A–Z classes combining more than one taxonomic rank are much smaller than that for Gastropoda, and even here the number of books in the entire A–Z sequence is not too large for searching on open access. In other classes like the monocotyledons, there may be separate A–Z sequences for families and genera and in others such as birds one taxonomic level, in this case the order, has been chosen for full listing in the schedules, and followed by a single A–Z series for all works on individual genera. The one doubt in this final case is whether it might have been wiser to make a rule that every volume in the A–Z class should be given an added entry in the catalogue to the appropriate order. At the moment the index entry 'Eagles' reads:

EAGLES GD12
  Aquila GD29(A)
  Haliaeetus GD29(H)

With the large number of catalogue entries for this part of the classified catalogue on microfiche, this means looking at three frames of the fiche to find all books on eagles, but if added entries to the order had been given, all books would have been listed in Falconiformes, GD12.

Indexing of any classification scheme is of paramount importance, especially for an in-house unpublished one, and much effort is being put into the improvement of the index to the SRL classified catalogue. The most specific terms should be looked for first, then slightly wider ones or synonyms. For names of organisms in applied areas like agriculture and animal husbandry, SRL prefers English common names, using them to provide the A–Z notation. Cross references between pure and applied areas are frequent, and the scientific name is given following the common name where this will be helpful. Problems of synonymy for common names may be dealt with by the use of standard reference works in applied as well as classical systematic subjects; for example I. L. Mason's *Dictionary of Livestock Breeds* 2nd ed[13] is the standard work for breeds of cattle. An example of a taxonomic index entry showing the necessary spread of topics outside the systematic schedules may show how SRL tries to help its readers to lateral thinking, since our best efforts cannot bring together the literature needed for every type of search:

MOLLUSCA—FV00—FW6
  Anatomy and embryology, general—FV60–76
  Classification and taxonomy—FV9
  Collection methods—FV10
  as Disease vectors, control of—EP58
  Fisheries, general—EM37
  Fisheries marine—EM41
  Fossils, general—FV50–58
  Freshwater—FV33

Marine—FV31
Physiology, general—EU18
Terrestrial—FV35
Physiology of particular organs—see the organ
See also particular taxa

That final entry brings us back to the title of this meeting, 'Biological nomenclature applied to information retrieval'. The Science Reference Library Classification for biology as interpreted by its biologically trained librarians has four main aims in its use of biological nomenclature.

1. The bringing together on the open-access shelves of the library the classes of books and periodicals which will most probably be used together, and will facilitate the retrieval of unindexed information.
2. Use of the type of nomenclature, scientific or popular, most appropriate to the discipline under study.
3 Maintenance of a consistency in its use of biological nomenclature which will be readily recognised and used, though not necessarily agreed with, by the professional biologists using the Library.
4. Retaining sufficient flexibility in the scheme to allow for the accommodation of new concepts and permit the reflection of accepted changes in biological classification with a minimum of library reclassification.

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Discussion

The participants at the meeting consisted mainly of librarian and information scientists from institutes concerned with either pure or applied biology, and included several involved with editing and with the production of abstracting journals as well as a few practising biologists. Their interest in biological literature and information varied from all important and largely taxonomic to one facet of a large general library. Library classification schemes in use by participants included Barnard, Bliss, Dewey, Garside, LC, NLM, UDC, and several in-house schemes.

The meeting was divided into five groups according to their expressed interest. Each group was presented with a series of questions topics for discussion largely derived from those pre-submitted by participants. They are given the option of discussion all or any of the suggested topics in the time available.

The results of these discussions were reported to the whole meeting and further discussion was stimulated. Written reports, published here in brief, were later submitted by the rapporteurs.

1. *Biosis' Taxonomic Reference File*

Leader: E. M. Zipf
Rapporteur: S. M. D. FitzGerald

DR ZIPF answered questions on the TRF, and gave the following additional information. The idea of the TRF was first proposed in 1969; it was thought likely to take about 20 years to compile the TRF; funding is being sought from various agencies. Although the compilation of a TRF is a massive undertaking, the need for it was so great, both within BIOSIS and in Chemical Abstracts and their users, that it is felt it would be worth doing. The inclusion of data additional to taxa and bibliographic references (eg geographic distribution) was considered by BIOSIS to be worth attempting, as such information would be available in the source of the names being input to the system, and would not require further research. An experimental file of 40,000 entries had proved very useful.

The most efficient way of gathering data would be to use existing compilations, such as lists produced by national and international registration authorities, floras, faunas and taxonomic reviews, increasing numbers of which are being published. Museum catalogues would also be useful, especially as many in North America are already in machine-readable form. Sources used in its compilation, and especially the works to be used for guidance on the general taxonomic arrangement within the various groups of organisms, would be chosen after consultation with experts.

All BIOSIS files are necessarily selective, and can never be complete; the problem of whether or not to include reports of inadequate research, papers repeating earlier publications etc. will still apply to the TRF. Nevertheless, it is intended that all names used in the literature should be recorded and cross-referenced where necessary. The TRF could only be authoritative in so far as it indicated BIOSIS' own preferred indexing terms.

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2. *Secondary services and changes in biological nomenclature and classification*

Leader: C. Norris (BL, MEDLARS)
Rapporteur: S. M. Childs (SW Thames RHA)

The current state of a variety of databases were discussed. It was not known if BIOSIS could alter past records. MEDLARS could alter past records on the computer files if there was a one to one correspondence between the new and old terms. CAB did not alter past records, but merely inserted cross references in the current index. It was suggested that CAB could improve their policy by enriching with current names. It was also possible that if a programme was written they could alter their back computer files as was the case with Medlars. In all cases there is a great problem with the old manual files, which cannot be altered. Medlars, at the beginning of each yearly cumulated issue, records the index term changes and dates them, so that one ought to be able to work backwards and know what index term was used for a given issue.

The value of card indexes, such as that produced by CIE was discussed. It was felt that if these could be computerised they would be very useful (a) for CIE to produce its own index (b) for other CAB units in the production of their journals and (c) available online for users. In effect they would act as an authority file. There were problems with this: (i) 70,000 items in the CIE card index would take a lot of work to computerise and (ii) not all units produced such card indexes.

In the matter of name changes the role of the secondary services were discussed. It was felt that users relied on these centres of expertise to keep abreast of such changes. Many users in remote places could possibly not be aware of a name change until a few years later. A need was felt for an investigation into co-operation between databases at specialist levels, not only in the field of taxonomy but also in nomenclature. It was regretted that many of us had known nothing of the TRF until we had come to the meeting.

The problem of freetext language, particularly when inputting from several sources, was discussed (eg problems of standardization in CAB). It was noted that as regards American versus English language that American language was dominant. In the above cases a thesaurus could be useful. The general problem of enabling users to tell their problems to the producers of the systems so that the system can be improved was touched on. CAB in particular, were very keen that users would tell them of any problem they had with the system.

E. M. DRON: A major biological secondary service not mentioned was *Zoological Record*. This has had many changes in arrangement due to changes in zoological classification. Has anyone looked into provision of a guide to the various schemes used at different times?

J. M. HOWCROFT: It would probably be very difficult, if not well nigh impossible, to provide any guide to classification schemes used in past volumes of *Zoological Record* prior to about the last ten years. In those days the *Record* was compiled entirely on a freelance basis, by specialist taxonomists working on their own particular groups, who would follow whatever classification they accepted at the time. For more recent volumes, the task would be easier, though it will be appreciated that over the last few years all our resources have been channelled into trying to get the *Record* more up to date.

It is BIOSIS' hope and intention that eventually *Zoological Record* will be available online, from the current volume (115, 1978 literature) onwards and hopefully back to Volume 111 (1974 literature). Such a project will have to involve a great deal of work on compilation and provision of retrieval guides such as Dr Dron mentioned. As far as the taxonomic names themselves are concerned (rather than their position in the classification) a tool such as the Taxonomic Reference File would not only provide for consistency of usage between secondary services, but could also provide users of those services details of all synonyms, previous names, alternative spellings etc. which would ensure maximum retrieval. It is also hoped that the TRF system would provide links between alternative classification schemes again aiding in retrieval.

3. *Reference sources to taxonomic names*

Leader: P. I. Edwards
Rapporteur: P. Gazder

The group agreed, after discussion, that:

Sources of taxonomic names were adequate, but were not always well known to workers in applied fields. A list of sources would be useful, and this should not only list suitable reference works, but also provide a directory of experts and their specialities.

There was a need for good reviews, either in the form of monographs or as articles in journals which would describe sources and cover suitable search techniques for particular taxonomic areas.

4(a) *Library Classification schemes and biological literature*

Leader: E. M. Dron (BL SRL)
Rapporteur: T. Cullen (MAFF, Slough Laboratory)

The following points were made:

1. All published classification schemes are usable with biology, but the number of libraries that modify published schemes are evidence for their drawbacks.
2. Faster updating of published schemes would improve the situation, but the group realized the amount of 'international bureaucracy' the schemes were involved in.
3. New concepts within biology (biotechnology) are causing more problems than changes in taxonomy.
4. Indexes to classification schemes are of prime importance.
5. Ultimately, users must decide if a library is to adopt new taxonomic schemes.

4(b) *Library classification schemes and biological literature*

Leader: J. Mills (Polytechnic of North London)
Rapporteur: C. J. Honnor (COPR)

Two points only were discussed in detail:

1. Many taxonomists now accept that the 'Arthropoda' are polyphletic. Only one bibliography had been found which reflected this change. No published classification scheme had done so so far.

Librarians would have to make adjustments to their classification schemes as they found necessary. Changes would come about sooner in specialist libraries collecting large quantities of literature in the field that in academic or public libraries.

2. An academic library classified by Dewey had found that in some parts of the biological sciences the Dewey citation order 'organism' before 'process' did not unite the needs of students. Modern courses were process orientated eg Biochemistry, Ecology, Physiology and students were unable to find items on eg the neurophysiology of the cat because it was in the 'Mammals, Carnivora' section. The library proposed to partially switch the citation order in 'Physiology' and 'Morphology' so that the shelf arrangement would be

Physiology—General
Physiology of specific animals and plants
  (Prefer to use more general categories below)
Physiology—Plant
  Photosynthesis
  Transpiration
  etc
Physiology—Animal
  Neurophysiology
  Endocrinology . . . and so on.

This sort of rearrangement would not be suitable for applied libraries in such fields as Agriculture. It was suggested that rather than change the citation order selectively, an operator facet could be applied where desired. The 'Precis' indexing scheme used the 'study sample' facet to subordinate purely test animals or plants, to the processes facet.

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Recent developments in information for planning

Brenda White

Capital Planning Information

Paper presented at the ATPG/RSIS seminar, London, Library Assocation, 6 November 1980

IN A JOURNAL article some years ago, I compared the planning profession to the profession of librarianship, both seeking a body of respectable theory with which to support a fundamentally practical activity. I think that that parallel is still true, although in many ways we are all now looking for a respectable and viable practical activity. Planners, like librarians, are still in search of an identity; even, in many cases, in search of a recognisable professional job. There are rumours that the new technology, the micro, the chip and so on will render librarians unnecessary: a recent paper[1] by Dr Dennis Lewis of ICI Plastics Division asserts that ' ... the days of the information officer and library worker as we know them are numbered'. ' ... in the year 2,000', he says, 'the information scientist and the librarian will have gone the way of the brontosaurus'. Clearly, librarians need to re-examine their role in the developing world of information technology and to adapt and change to meet changing circumstances and needs. It is perhaps not quite so obvious, but it is equally necessary, that they should change and adapt to meet changing patterns and sources of information and to accommodate new developments in the structure of the information they are accustomed to handling.

A similar searching process is going on in planning. A recent research report from the School of Advanced Urban Studies in Bristol carries the title 'Town planners in search of a role'.[2] David Eversley of the Policy Studies Institute recently contributed a thoughtful and deliberately provoking article[3] to the weekly journal *Planning* in a series called 'Planning for the 1980s' in which he claims that 'the professional planners themselves have done little to adapt their thinking to the fundamentally changed social, economic and political conditions of the 1980s ... '. Planning generally has fallen into such disrepute that it is possible for pundits like Peter Hall to write books about 'great planning disasters'. Planners are buffetted between the hostile forces of central government, elected members, organised activist groups and of course—the public. The Secretary of the Association of County Councils, John Stevenson, speaking at the 1980 Town and Country Planning Summer School, has warned that unless planners are prepared to adapt their policies to budgetary realities, less informed people will do it for them.

The general situation of the planners then is hardly secure, not always happy, and rather less well-defined than it used to be in the days of real 'town and country

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planning'. When I and others looked at the information needs and use of planners ten years ago,[4] we found a pattern which reflected a fundamentally practical activity—the accent on those information sources which were effectively 'working tools', the maps and the survey data, whether derived from self-generated local exercises like household surveys or from central government sources, printed or tape. The need was identified then for information on comparative experience, largely for the documented efforts of central and local government and consultants, in planning areas ranging from regions to conservation areas. If we did another information use study now, I think that we should find, despite a decade of fundamental change, that these basic information priorities still hold good, even though the information itself has changed quite radically.

On the literature side, the books, journals, and secondary services, I believe that again a similar use rating would apply, but here there has not been so much change in the actual sources. So far as journals are concerned, formats, frequencies, printing methods have all changed, editors and some titles have changed too, but the 'core' British planning journals of 1970 remain the 'core' planning journals of 1980 and I would guess that their use rating is similar also. As with journals, so with textbooks. If it was difficult in 1970 to define a standard text in terms of planning, it is a remoter possibility in 1980 when planning in practice is so thoroughly understandardized.

For secondary services, we still rely on the major libraries at the Department of the Environment, and the Greater London Council to provide the major abstract journals, and there is still no 'planning abstracts'. Nor is planning one of the subjects to have got itself online.* There is in fact no single comprehensive, defined and ongoing bibliographic data base to be made available. On the bibliography side, the situation has certainly improved, and again a major contribution comes from the DoE and the GLC libraries. The DoE Library has by now produced a very substantial list of large and small bibliographies and guides to sources of information (the two are not synonomous), as has the GLC Research Library in its various series, now all called *Guides to Research Documents*. I make no apology for mentioning also the contribution of my own company, Capital Planning Information, to the bibliographical scene because our series of Sourcebooks, Topicguides and Information Reviews do aim to provide balanced and evaluative guides to information sources in a variety of subjects, several of which come within the category of planning information.

Are secondary services used by the actual planner at his actual desk any more in 1980 than they were in 1970? I doubt it very much. It is the librarians who keep them going. And so, in the actual pattern of use, in the predominance of the working tool over the literature, I would suggest that there has been little change in the last decade. In the information itself, however, as has already been suggested, there have been some major changes in key sectors, not always necessarily for the better, and in many cases brought about by external factors—economic pressures, government changes, political desirability, and organisational change.

The most fundamental change has been in the information associated with central and local government. In terms of quantity, the former has declined, particularly in the last year, while the latter has flourished. Local government is in fact probably the major producer of planning information in 1980, although recent research[5] has shown that the planning department is not necessarily the major information producer among other departments that it was always supposed to be. The figure of 50,000 documents a year produced by British local authorities has been bandied about recently. That may be true, across the board, if by document is meant every piece of paper produced. But in terms of reasonably substantial documentation of planning issues which are of some real universal interest, local government throughout the UK is producing—at an educated guess—up to about five thousand items a year. This is a lot more than it was producing in 1970.

The interesting thing is that, as planning *in practice*, at macro and micro level, becomes less standardized, less tangible and more distorted by the impact of unique events of national or regional significance which impinge upon the local planning process, the documentation which arises from the processes of planning has become much more standardized than it was a decade ago. The labels given to the documents vary enormously of course, as do their quantity, quality and interest value, but by and large as planning authorities move through the due procedures of structure plans and local plans, the resulting documentation follows an identifiable pattern also.

The basis of the documentation is in fact quite carefully prescribed, and it is worth looking at this since it forms a substantial part of local government's output of planning information. Take, since we are in London, the case of a London borough. Sections 11 to 15 of the Town and Country Planning Act 1971 permit the borough as a planning authority to prepare a local plan for any part of its administrative area: this of course has to be done within the strategic framework laid down by the Greater London Development Plan. The Act then specifies quite precisely that:

> 'a local plan shall consist of a map and a written statement outlining the authority's proposals for the development and other use of land in the plan area. The plan shall contain the necessary diagrams, illustrations and descriptive matter to explain the proposals.'

For the London borough, the matters to which the local plan written statement are required to relate are then fully stated in the Town and Country Planning (Local Plans for Greater London) Regulations 1974. As the authority thinks appropriate (and this is an indication of the permissiveness which affects so much of the legislation of the past decade) it can deal with:

(i) Distribution of population and employment;
(ii) Housing;
(iii) Industry and commerce;
(iv) Transportation;
(v) Shopping;
(vi) Education;
(vii) Other social and community services;
(viii) Recreation and leisure;
(ix) Conservation, townscape and landscape;
(x) Utility services;
(xi) Any other relevant matters.

This list is contained in Regulation 9 (1); Regulation 10 also gives guidance on those matters such as context, relationships, resources and criteria which are to be contained in the plan. Yet more detailed guidance on content is given in two Department of the Environment Circulars, 55/77 and 4/79.

In terms of planning information, therefore, the written statement and its accompanying proposals map is the centrepiece of any authority's production; its labelling and its contents are prescribed and identifiable, whether the plan is a structure plan or a local or district plan. Before and after, and indeed simultaneously with the written statement, which initially appears in a draft form, there can be a maze of supporting documentation. Before the written statement, there is the report of survey, which sets out the issues and the opportunities involved; and a statement of policy options, expressly for public consultation. These documents may be supported by area studies, by topic reports, by issues reports, or by position statements, all of which give detailed treatment to specific aspects of the plan area. What the report of studies does, in effect, is to summarise these various detailed papers.

Then comes the draft written statement, and often this is accompanied by a report on the process of public consultation. Adoption comes after two to three years and the draft plan, modified as necessary after the due processes of examination and consultation, becomes the plan, the statutory framework which influences and guides development over a period of ten to fifteen years.

Publication of the adopted plan is by no means the end of the documentary road—county planning authorities, for example, are now producing annual monitoring reports—but this brief résumé of the main elements in the chain serves to indicate the extent of local government's basic contribution to planning information. Now—consider the multiplication of these elements by the number of county, region and district authorities which are statutorily empowered to produce; consider that planning authorities do not produce the series of elements for only one situation—the London Borough of Newham, for example, is preparing six statutory district plans which will eventually cover the whole borough. Consider the great variety of other planning situations which result in documentation, some of it of considerable wider interest—the conservation reports, the plans for enterprise zones, for reclaiming marshes, for saving villages, for reducing pollution, for recycling waste. Consider also the range of new information stimulated by new techniques—environmental impact analysis, for example, which in the last decade has amassed a whole new literature. Consider finally (and the list is by no means exhaustive) the quantity of planning and related information produced by research and intelligence units, and it becomes clear that local government as a whole is a very significant producer, perhaps now *the major* producer, of planning information.

From the total of planning information, we can now subtract, perhaps rather sadly, a whole range of documents which in the sixties were deemed to be the real standard texts of planning—the glossy consultants' reports, the new town master plans, the regional reports and studies and the sub-regional studies. This whole category of planning information has passed from view, its interest now largely historical, confined to planning schools and academic libraries. These were expensive visions of Utopia; many of them were based on mathematically contrived forecasts whose fallibility was demonstrated only too clearly by events such as the collapse of Rolls-Royce in Derby, in the middle of the Notts/Derbys sub-regional plan area; as such, they have no place in planning for the 1980s.

As local government production has increased, it is equally true that central government's contribution to planning information has decreased, and the decrease has been particularly marked in the last year or two. The changes and the cutbacks in central government's output are perhaps the most significant recent development in planning information. There are two aspects to it—one is the matter of accessibility and the other is the actual information.

The accessibility of central government information is a well-rehearsed subject and is not unique to planning. The problem is that over the years an increasing quantity of information, some of it in the form of major reports and research studies, has bypassed the official HMSO publishing and retailing channel and has appeared instead as departmental publishing, sometimes printed by HMSO, but obtainable only from the originating division, branch or unit of the Department. With a monolithic structure like the DoE, this trend causes very obvious problems of access. With the official publications, if you have the stamina to scan the Daily List systematically and the endurance to obtain required items from the Government Bookshop, there is no problem. With the other publications, and it is reckoned that considerably more than 50 per cent of government publishing is now non-HMSO, it is a very random business. In this area, however, planning is better served than some other subjects, thanks to the efforts of the DoE Library which now supplements its excellent Annual List of departmental publications, first issued in 1971, with a monthly supplement to the fortnightly Bulletin which lists both HMSO and departmental publications from Environment and Transport issued during the preceding month. These lists give full details of the sources from which to obtain departmental publications, and of the prices. This latter items is important since the principle of 'cash with order' is put thoroughly into practice.

An all-embracing solution is about to be launched by the publishers, Chadwyck-Healey of Cambridge: 1981 will see the first instalment of their *Catalogue of British official publications not published by HMSO 1980*. Chadwyck-Healey estimate that there are over 25,000 official documents each year *not* published by HMSO, coming from nationalised industries, research institutes, quangos and other official bodies as well as the actual departments of central government. The publishers are planning an annual volume, to be published in March 1981, which will cover documents published in 1980; publications throughout 1981 will be listed in a bi-monthly catalogue with annual cumulation; thereafter, the catalogue will become monthly. This is an ambitious venture which is supported by HMSO, and—perhaps one of its most useful aspects—it is to be backed by a microfiche document supply service.

But more significant than this problem of accessibility, is the changing nature of government planning information itself. Firstly, in terms of quantity—there is a lot less of it. It is quite remarkable that by October 1980 the Department of the Environment has reached only no. 18 in its numerical sequence of Circulars; although at least some material is being sidetracked into a new species called the 'unnumbered circular letter'. Transport has an even lower tally of 2. In Scotland, the Scottish Development Department has also reduced its output of Circulars, being at the end of October at no. 36. The volume of departmental publishing has also contracted. All this is reflected in the DoE Library's Annual List for 1979, which contains 79 pages against 108 for 1978, 126 for 1977, and 149 for 1976. I would guess that the 1980 List will have even fewer pages.

This reduction, as everyone knows, is part of the present government's declared intention to cut down on paper. In itself, this is not such a bad thing; certainly some rationalisation of production was desirable. But such a sizeable reduction does raise the question—what has happened and what is happening to all the information? Or was the information content so insubstantial, the padding so thick, that it is perfectly feasible to repackage several quarts as a couple of pints? The present Environment Secretary is reputed to have no time for any document more than two pages in length. Again, it is impossible not to acknowledge that many official papers and reports in the past have been substantially padded, and in many cases could have been successfully concentrated into, perhaps not as few as two, but probably ten pages.

This trend towards concentration raises two issues of fundamental importance to planning information. One is that inevitably the information is more generalised, in that pressure of space tends to remove the qualifications and examples which are often vital to a proper understanding of the message. This at the least can cause misunderstanding and at worst is dangerous. The second is that the shortness of the document leads to its rating as ephemeral; following this argument through, if the information *can* be compressed into a few pages then it *can* be issued in a format which may well be regarded as ephemeral (assuming, of course, that it is not preordained Circular material or similar). This trend, taken in conjunction with the desire to cut costs, has now led to the situation where a great deal of planning information, much of it significant to practising planners, is issued in the form of Department of the Environment Press Notices.

Press Notices are, in fact, being used as a substitute for formal publication, particularly for continuing statistical information and even occasionally for discussion papers. Statistics of planning applications, for example, the quarterly figures of planning applications dealt with by local planning authorities in England, are now contained in Press Notices. Orders for new construction; house prices and mortgage statistics; local government manpower (the Joint Manpower Watch); homeless households; and house-building, renovations and slum clearance; are other examples of the kind of statistics which are now being produced in this form. Planners themselves, the local authority associations—the Association of Metropolitan Authorities has been particularly outspoken—and the National Development Control Forum are all highly critical of this new form of publication of statistical information. Speaking specifically of the statistics of planning applications, the AMA has said that the way in which they are presented in Press Notices—national papers getting national data, local papers getting local data—makes it impossible for local authorities to make the sort of comparisons which the statistics are meant to facilitate.

The whole area of government statistics has become confused over the last two years or so, and since many major, and minor, series are basic ongoing planning information, the situation is of some concern in this context. The Government statistical services as a whole have been the subject of a detailed investigation by Sir Derek Rayner, whose report on them is now due. Since the purpose of the investigation is rationalisation and cost-cutting some major changes may be on the way. These changes are most likely to be of two kinds: curtailment or complete withdrawal of coverage in some areas: and the letting out of services to private or commercial enterprise.

In the first category, the 1976 sample census has been the first major casualty, and the effects of this in planning terms are clear: the most recent information on the national population and all the analyses which derive from that, dates from 1971. It is hoped that Sir Derek Rayner is aware of the costs incurred *outside* central government, *i.e.* by local planning authorities, as a result of cost-cutting exercises *within* it. In the second category, a trend has already become noticeable, in the dissemination of planning appeal decisions by private publishers—in England and Wales by Ambit Publications, with their annual series and now also their *Planning Appeals Monthly*, which started in September 1980. Both series derive their input from the Department of the Environment. And in Scotland, the Planning Exchange in Glasgow publish a quarterly bulletin of Scottish planning appeals, whose material again derives from official sources, in this case the Scottish Office.

The most likely contender to take over the major government statistical services is the Chartered Institute of Public Finance and Accountancy (CIPFA) which has already indicated its interest. CIPFA (along with other organisations such as the Society of County Treasurers) already publish statistical series. What it is now contemplating is a wholesale takeover of the government's statistical services in the areas of education, health, social security, rates analysis, environment, housing and construction. CIPFA believes that the services could be self-financing from sales to private industry, government and the nationalised industries. Noel Hepworth, CIPFA's Director, has said, however, that the Institute would be interested in taking over the services only if it were allowed freedom to present the information without being tied to political control, and to pursue its aim of providing the public with the best information.

Turning from local and central government and official publications, another development of the last decade, which is entirely beneficial, is the growth of the newsletter—the alternative journal. I noted earlier that so far as the 'core' planning journals were concerned—and by these, I mean those long-running titles of Institute, Association, university and a select few commercial publishers—there has been very little change except in matters of format and editorial style. But alongside these has grown and flourished a small army of regular news sheets and newsletters, some devoted to fairly narrow aspects of planning but covering among them a remarkable range of detailed information.

Partly, the growth of the newsletter can be put down to economic factors. More importantly, it is due to the faster production schedules obtainable with litho-printing or even in some cases photocopying; and the recognition that, if the information is good and current, it does not need to be carried on glossy paper inside a full colour cover in order to be taken seriously. Perhaps even more importantly, the informality of the format is attractive and easy to read and offers an ideal vehicle for those short, almost chit-chat items which often contain more hard bits of information than many long articles in heavyweight journals.

One of the best examples of a good newsletter, packed with information, written by regular contributors, with pertinent editorial comment, is *BURISA*, the newsletter of the British Urban and Regional Information Systems Association. Now in its 45th issue (September 1980) on a bi-monthly schedule, *BURISA* reports on the information scene in central and local government in the UK. This is predominantly the data and information systems scene, but there is always a great deal of interest to anyone with a concern for planning information in general. And the majority of the items cannot be found in alternative sources.

Much the same can be said about the Countryside Commission's quarterly *Recreation News*, whose contents again are largely unduplicated. It does for recreation and leisure planning what *BURISA* does for the more limited field of planning information systems. But the point is that it does it well.

These two titles are not the start of a catalogue, rather two examples of a flourishing and very valuable source of ongoing planning information. There are many others; those in subjects peripheral to planning, such as the newsletter of the Social Research Association, should not be overlooked; and nor should the overseas examples, such as the news sheet of the Australian Institute of Urban Studies and the unique *Urban Innovation Abroad* published monthly by the Council for International Urban Liaison in Washington, DC.

Many of these newsletters are compiled and published—often also sold and despatched—by small to medium-sized organizations, associations, societies and so on, whose primary purpose is *not* publishing—certainly not commercial publishing. This again is an interesting development of the last decade—a high proportion of documents published for sale are now published by other than commercial publishers. The situation carries all the problems that librarians can rehearse so well. But it is a fact that a sizeable, and certainly to some extent significant, portion of planning information is produced by small part-time publishing enterprises which range from university and polytechnic planning departments right down the scale to individuals.

Included in this diversity of small producers of planning information are the planning libraries themselves. And here we come full circle to look at the role of the librarian in the face of the new developments in planning information. Is the planning librarian of 1980, like the planner, in search of a recognisable professional job? Has he adapted to meet changing circumstances? In the majority of cases, the answer has to be 'no'.

The librarian's growth industry of the last decade, the tool which he has chosen to develop as his professional justification, is the current awareness bulletin. All over the country there must be scores of planning librarians relentlessly culling the pertinent items out of the same journals and regurgitating them in a variety of tasteless and ill-designed formats, for the benefit of they are not quite sure whom. (There are of course some decent-looking ones, and the disease is not confined to planning librarians.) But this national waste of time is a development which should not have taken place and it seems a pity that librarians themselves should not have used their imagination and expertise to develop planning information services in more constructive directions.

If it were possible to wean librarians away from their current awareness bulletins and to persuade them that the costs would be better re-invested in multiple copies of the standard local government weeklies whose contents they are listing, how can they better employ their time as exploiters of planning information?

Consider the point that the planning department of a local authority, even a small one, is in itself a collective store of information, some of it in the form of documents, some of it not so neatly packaged, but much of it of continuing value; and consider that if easy access were available to the problems and the decisions of previous years and previous planners, how much less time would be spent by present planners in reinventing wheels and ensuring inconsistencies in planning solutions and decisions. The librarian has a key role to play in exploiting this continuing and cumulating store of planning information for the benefit of his own organisation.

Secondly, consider the role that the library can play as an informal exchange about the activities of its own department and its authority in general, quite apart from the world outside the authority. To fulfil this function, a librarian has to get out and about outside the library walls. Many librarians seem to be afraid of doing this, and thereby they condemn the library to its traditional passive role. But if that library is to survive—and if it cannot be seen to be using its budget to perform an essential service, it will *not* survive—the librarian must go about and listen and learn and make of the library the centre which knows more about the overall business of the department and the authority than any other source.

Thirdly, on the central government information side, I believe that the librarian will perform a most valuable task in simply finding out where all the various types of information are, and in disseminating this knowledge. Particularly in the matter of statistical information, systematic identification of sources revevant to the library's own department would be of inestimable value.

In effect, the library should be the communications centre of the department, a centre which provides information, intelligence and know-how as well as documentation. The difficulties are well-known; and librarians too often are not sufficiently aggressive in overcoming them. The realities of financial cuts are with us all; but they are being used in some cases as justification for inertia. Let us at least fight for what we believe in: that the librarian *can* make his library into the place where people go to find out what is going on, both within the organization and beyond it. Whatever the changes in the availability and the nature of planning information itself, the establishment of the planning library as the information nerve centre of its organisation could and should be one of the really significant developments of the next decade.

AUTHOR'S NOTE

*The ACOMPLINE database was made available in February 1981 by the GLC Research Library, online through the ESA/IRS service.

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Problems of local government planning publications

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Paper presented at The ATPG/RSIS seminar, London, Library Association, 6 November 1980

I WILL START by quoting from two letters I have received from local authority planning departments in recent months:

> 'I refer to your enquiry of 22nd February and regret that as only a very limited number of copies of this report have been prepared it is not possible to issue copies to libraries at this stage'
> 'Thank you for your enquiry concerning the above consultation report. Because of the fairly specific nature of the report we only had fairly limited numbers printed. The interest locally has been such that we now have no copies available for supply to libraries, other authorities or those with a purely professional interest in the report.'

Local government planning publications present a two-fold problem to the librarian. The two letters illustrate one part of the problem: that of acquiring publications which have been identified by the librarian. But the other part of the problem is far more acute: that of discovering exactly what has been produced by local government. This I will call the problem of identification.

Librarians experience great difficulty in discovering what documents have been produced by local authorities. Most documents do not appear in the various abstracting and indexing services which are a major source of information for librarians. They are not mentioned or reviewed in the professional journals and newspapers. Local authorities do not send leaflets to libraries announcing or listing their publications, as do commercial publishers. The only way librarians can discover local authority documents is by writing individually to each authority and to individual departments within authorities requesting details of publications. Such requests must be repeated on a regular basis, if the librarian wishes to keep up with local publications.

There is an urgent need for bibliographical control of local government documents. There has been a rapid growth of such publications in recent years, particularly since local government reorganisation. There are statutory requirements for authorities to produce structure plans and local plans, transport policies and programmes, public transport plans and other documents. It is also incumbent on local authorities to encourage public participation and involvement in their planning processes and this has led to increases in numbers of documents.

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Most local authorities do not have the necessary expertise and experience to act as publishers. Documents are produced mainly by departments and it is the department which is responsible for a document's publication and sale. Several departments within an authority may publish documents separately without any central coordination or control. There is little encouragement to publish documents for sale, except where this is a statutory requirement.

This lack of control over local government documentation causes problems for different kinds of librarian. The local government librarian finds it difficult to trace even the publications of his own authority and much more difficult to identify the publications of other authorities. It is the public librarian who should be building up comprehensive collections of local documents. Librarians in national and government libraries need to know of documents. And the academic librarian will wish to acquire such material for the benefit of students, staff and research.

Difficulties stem from the lack of appreciation by local authorities of the value of information. So much useful information is being produced by local authorities many of whom are unaware or unconvinced of the value of this information to other local authorities, to central government departments or to research workers. There is a real need to convince local government that information is an asset which must be managed properly and must be made widely available.

There are therefore four needs:-

1. There is a need to convince local government of the value of information. During the survey, which I will describe later in this paper, I was told on several occasions that an authority's documents were of purely local interest and of no possible value outside that authority. Yet at the same time many authorities talked of their need for comparative information from other authorities with similar problems. For example a district planning department with an extent of coastline had sought information on caravan and camping policies. And it must be obvious that information on policies and practices for conservation areas could be most useful if made available from one authority to another.
2. The second need, and this is most important, is for the necessary administration for publications in authorities. It would appear that many authorities pay scant attention to the organization and sale of documents. East Sussex and Clwyd planning departments have good systems for publication and sale of planning documents, but even in these counties there are no central systems which cover all departments and which exist to promote the publications of the whole authority. There is a need for coordination between departments to promote the sale of documents. Where it may not be possible to employ a departmental publications officer, the employment of such a person on an authority-wide basis may be more feasible.
3. The third need is for local authorities to adopt policies for publication. Not every document need be made available to libraries and other outside bodies, but most will be of some interest. Structure plans, transport plans, subject and local plans and other statutory documents must be made available. A pricing policy is important, but practice varies greatly. Some authorities allocate a token price whilst others seek to recover the costs of printing and handling. Some give copies free

and others produce photocopies on demand and charge for them. The need to make statutory documents available to the public obviously restricts authorities from charging prices which are realistic in terms of the full costs of production. But it must be possible to establish a pricing structure which ensures that greater sales do not result in greater costs. The need here is for local authorities to formulate policies for publications, for determining prices and for estimating print runs.

4. The fourth and last need is for bibliographical control. I have already said that most planning documents do not appear in the various abstract and indexing services which are a major source of information for librarians. The need is for local authorities to deposit documents with national libraries, so that they appear in the British National Bibliography. The use of International Standard Book Numbers should be encouraged as this will lead to recording of items in national data-bases. Local authorities should be urged to offer documents to the British Library Lending Division and to the Departments of the Environment and Transport Library. Setting up of administrative systems for the publication of documents should ensure that deposit and sale to national agencies and libraries is achieved on a regular systematic basis.

I will now look at the various types and categories of local government documents. There is a broad range of such documents. At one end of the scale are the priced publications which may be produced in print runs of 1000 or more, like some structure plans or such 'best-sellers' as the Essex design guide[1]. These may be produced by commercial printers with a high standard of printing and production. Further across the scale are those statutory plans which are produced in much shorter runs but which are bought by libraries, other authorities and academic institutions as well as the general public. Moving along the scale there exists a large area of what may be termed 'semi-published' material; this comprises all those non-statutory documents which are made available to the public either at a price or free. Finally at the far end of the scale are the unpublished documents, such as committee reports, which are internal to each authority.

I will now describe the research project which I completed during 1979 into the organization and control of local government documentation.

First a little background to put the project in perspective. At Leeds Polytechnic Library we operate totally on the basis of subject librarianship and each librarian is responsible for a particular subject area. My own responsibility is for stock related to planning and for services to students and staff in Town Planning. Within this area the biggest problem is the location and acquisition of planning publications produced by local authorities. When I mentioned this within the Aslib Transport and Planning Group it was clear that the problem was general and widespread and not peculiar to Leeds and Yorkshire. I was then asked by the British Library Research and Development Department to research into the problem. Thus I came to spend one day a week for seven months during 1979 investigating problems related to the location and acquisition of planning documents. And at the same time I continued my job as Town Planning Librarian at the Polytechnic. I stress this dual operation since in my research I was attempting to find practical solutions to problems I was facing in my job.

The main aim of the research was to acquire sufficient background knowledge to the problems of local government documentation to permit practical solutions to be advanced.

The research was in three parts

(1) A survey of planning departments in local authorities in Yorkshire, Humberside and Cleveland.
(2) An analysis of the coverage of local government planning literature by abstract and indexing services.
(3) A detailed consideration of possible ways of improving the present system.

First came the survey. A limited geographical area was chosen comprising the 5 counties of Cleveland, Humberside, North Yorkshire, South Yorkshire and West Yorkshire. This is roughly the area which the School of Town Planning at Leeds covers for its part-time course.

The local authorities visited during the survey are shown in Table 1. All five counties were visited and eight out of the nine metropolitan districts. Of the twenty-one non-metropolitan districts six were surveyed. This gives a total of 19 out of 35 authorities. In addition visits were made to three 'foreign' counties—Cheshire, Clwyd and East Sussex—for comparative and pilot purposes. Interviews were held with planning officers in all the authorities visited. A standard list of questions was used in each interview. The questions were designed to find out how documents come to be written, how they are produced, whether there is any central control over them; how documents are made available, what publicity is given for them, whether they are sent local or national libraries: how orders are administered and copies supplied, whether local authorities would be willing to allow outside agencies to sell documents on their behalf and how planning officers find out about the publications of other authorities.

Full details of the questions asked and the answers received are given in the report[2]. The answers confirmed the belief that most authorities fail to publicise their documents to librarians and few have any clear publication policy. The majority do not send copies to the Copyright Office nor do they deposit them at the British Library Lending

TABLE 1. *Local Authorities Visited During the Survey*

Counties		*Metropolitan Districts*
Cleveland		Bradford
Humberside		Kirklees
North Yorkshire		Leeds
South Yorkshire		Wakefield
West Yorkshire		
Non-Metropolitan Districts		Barnsley
Hull	Richmondshire	Doncaster
North Wolds	Scarborough	Rotherham
Stockton	York	Sheffield

Division. In no case did any of the authorities have an administration system which dealt with all documents, irrespective of the department of origin.

I am grateful for the responses obtained during the visits and for the interest which individual planning officers showed in the project. But it is clear that most authorities attach too little importance to their publications and to their potential value. Information needs management and control just as much as other functions of local government. If we are looking for improvements in the system, fundamental improvements are needed at the point where documents are produced. It must be a long-term aim to convince local authorities of the value of their information and the need for its recording and control.

The second part of the research related to abstracting and indexing services in planning and their coverage of local government publications. Since most of the services are issued by libraries, these services should be a good indication of the extent to which local planning documents are reaching libraries. The five abstract/index services investigated were:

British National Bibliography
BLLD Announcement Bulletin
Departments of the Environment and Transport Library Bulletin
Urban Abstracts
Urbandoc News

TABLE 2. *Coverage by abstract and index services of planning documents for Yorkshire, Humberside and Cleveland*

Abstract or index service	Period checked	Total documents included	Counties (5)	Metropolitan Districts (9)	Non-Metro. Districts (21)
British National Bibliography	1978	7 from 5 authorities	3 from 2	—	4 from 3
DOE/DTp Library Bulletin	1978	25 from 4 authorities	25 from 4	—	—
Urban Abstracts	1978	9 from 2 authorities	9 from 2	—	—
BLLD Announcement Bulletin	1978	24 from 6 authorities	23 from 5	—	1 from 1
Urbandoc News	Aug78- July 79	1 from 1 authority	1 from from 1	—	—

In an attempt to obtain quantitative and measureable data I checked the 5 services for coverage of Yorkshire, Cleveland and Humberside planning documents. Each service was monitored for a twelve-month period and numbers of publications noted. Table 2 shows the results obtained.

What table 2 does not show is the total output of the local authorities in Yorkshire, Cleveland and Humberside. Indeed it was not possible to obtain or even guess such figures. But I was able to compare the holdings of 3 libraries with each other:

British Library Lending Division
Departments of the Environment and Transport Library
Greater London Council Research Library

and then to show the holdings of the Leeds Polytechnic Library. These results are given in Table 3.

The third part of the investigation was perhaps the most important. This was to identify how the system may be improved and to look for practical solutions. Three main areas of possible improvement were identified:-

1. *Local authorities to improve their publication practices*

A more professional approach to publishing on the part of local authorities would offer a certain route to improvement. During my investigation I visited East Sussex planning department for comparative purposes. Here I found a clearcut

TABLE 3. *Holdings by major libraries of planning documents for Yorkshire, Humberside and Cleveland*

Library	Total Documents Held	Counties (5)	Metropolitan Districts (9)	Non-Metro. Districts (21)
British Library Lending Division	69 from 7 authorities	66 from 5	2 from 1	1 from 1
*DOE/DTp Library**	30 from 9 authorities	26 from 5	2 from 2	2 from 2
GLC Research Library	16 from 4 authorities	16 from 4	—	—
Leeds Polytechnic Library (for comparison	426 from 26 authorities	170 from 5	188 from 9	68 from 12

* DOE/DTp figures do not include statutory plans deposited with the Department (held in Room P3/169 but not included in the library catalogue).

policy: a comprehensive publications list is maintained, a mailing list for new publications is operated, and there is a standing order list. The county has a pricing structure and copies of publications are sent to the Copyright Office and to the British Library Lending Division. International Standard Book Numbers are assigned. No other authority I visited could compare with East Sussex's well-defined policy. A process of encouragement and education is needed to gain improvements and the process will be slow and long-term.

2. *Abstract and indexing services to cover local authority documents in greater depth*

Improvements in this direction will be of help to planning librarians, but will depend to a large extent on improvements in local government publication practices outlined in solution no. 1.

3. *Creation of a national agency to collect and record local authority documents*

Such an agency would act as a 'middle-man' between local authorities as producers of documents and librarians as users of these documents. In my report I list the possible functions of such an agency:

1. to record publications
2. to issue a regular bulletin listing them
3. to acquire a copy of each publication
4. to lend documents on request
5. to maintain catalogues of the collection and answer enquiries
6. to issue selective bibliographies
7. to acquire multiple copies of documents and sell them.

I do not necessarily advocate that the agency should fulfil all these functions. But it would be possible to make a start on the first few in the short term with only a modest outlay of finance.

For instance the agency could be based at the British Library Lending Division. There the first four functions are being operated in a limited way already. Local authority publications are received by the library, recorded, listed in the monthly Announcements Bulletin, and lent on request. If the British Library Lending Division were to collect documents on a much wider scale, this would be the start of an effective agency.

In order to do this I recommend in the report that the British Library Lending Division should establish a separate section with responsibility for the acquisition of local authority documents and I suggest that the staff of this section should adopt an out-going attitude to the collection and acquisition of documents. The documents should then be listed in a separate local government bulletin. At present those documents which are received are listed in *BLLD Announcements Bulletin*. I should be surprised if many librarians in the planning field regard this as a prime source of information. The *Bulletin* is poorly presented and inadequately classified and indexed. It lists reports, translations and theses. Local government publications may appear under any of the subject categories. Most of those which relate to planning seem to appear under *Behavioural and Social Sciences—Administration and Management*, although a random check of one issue revealed three items by Cleveland County

Council under *Aeronautics*, since they related to Teesside Airport. There was a proposal that the Announcement Bulletin should become a BNB Reports Supplement, but there seems to have been little progress with this.

One possibility which was dismissed without much discussion in the report was the possibility of a chain of regional information centres. The main reason for its peremptory dismissal was that the need and demand for planning information does not fall readily into regional categories. The demand is usually for subject information; for instance, planning for take-away food shops; or for methodology.

But the library at Leeds Polytechnic does concentrate on the creation of a regional collection. It is impossible and unnecessary for an academic library to attempt to collect all local government planning documents, irrespective of their origin. The aim is rather to establish and maintain a balanced collection to complement the teaching in the School of Town Planning. At the same time I do collect as many documents as I can locate for the area of Yorkshire. I do this for several reasons:-

1. Local documents are well used
2. They are easier to locate
3. The creation of such a collection builds a closer bond between the library and local planning offices.
4. If each academic library with a planning collection does the same, a network of local collections will emerge. If the School of Town Planning at Oxford Polytechnic were to organize a field trip to North Yorkshire, I would be willing to make available a collection of documents to provide background information. And if Leeds students were to go on a field trip to Oxford, it would be useful to borrow documents from Oxford Polytechnic.

The collection of regional documents is not fully comprehensive but it is growing in width and volume all the time.

AUTHOR'S NOTE

The research was published in November 1980 in the Planning Papers series issued by the Leeds Polytechnic School of Town Planning[3].

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Abstracting and indexing services in planning

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Paper presented at the ATPG/RSIS seminar, London, Library Association, 6 November 1980

THIS PAPER IS concerned with the purpose of functions of abstracting and abstracting services, touching on indexing only in relation to the indexing of abstracts, and concentrating mainly on 'hard copy' printed services. It is presented from the viewpoint of both a producer of an abstracting service and a user of other peoples' abstracting services.

Though online services are growing and there are exciting developments such as the GLC's ASSASSIN service, there are, in the planning field, very few computerised services which are as yet fully developed, economical for the user, or a practical proposition for the small library or small organization without access to a terminal. Moreover as yet there seems to be no evidence that an online service leads to a reduction or fall-off in subscriptions to a printed service; indeed the two seem to be complementary, and the impact of online to print to date has been small[1].

Many abstracting services start as in-house services, as a development of accessions lists, or as a form of current awareness service, provided for the officers, research workers, administrators, academics, planners within the organization; in my own case for the officers of the Departments of the Environment and Transport. Other services are developed for the members of professional organizations, for example the Royal Institution of Chartered Surveyors; or for members of an agency of government like the National Water Council; or for a large local authority like the Greater London Council. All these, designed for a specific clientele, have become, in some cases almost by accident, useful to a much wider audience—to other individuals or organizations outside the immediate parent body.

The economic case

Unfortunately in periods of economic stringency many small libraries stop producing or subscribing to services, preferring to devote their slender resources to primary sources. If a service loses too many subscribers, it loses some of its justification and the parent body may feel it can no longer support it. Yet it is the small organization which can make the greatest use of a good service.

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The economic case for a bulletin, accessions list or other current awareness service has been well presented by R. A. Nightingale of British Petroleum, way back in 1973[2]. His formula was—one weekly, plus five monthly journals produce 112 issues a year. At ten seconds per issue, a reader would spend 18½ hours each year scanning those issues. On a basic salary plus overheads of £7,000 a year, his scanning time would cost his organization £74. 400 people doing the same thing gives a total of £29,600. Nightingale calculates that the cost of a bulletin covering the same journals—and remember he was writing in 1973—is £2,500. The cost benefit is some £27,000 per annum to the organization.

Try this sort of equation on your own pet service—the cost-benefit may not be quite so dramatic, but I would be surprised if it were not quite substantial. Labour costs of course are going up all the time, as are printing costs, but so are the costs of journal subscriptions.

The need for abstracting services

The latest edition of *Ulrich's International Periodicals Directory* gives a total of 62,000 journals currently being published. Of these, something like 50,000 are in the English language. *Ulrich* does not give Planning as a heading—the nearest is Housing and Urban Studies, where some 300 journals are listed, and if you follow through references to Architecture, Building and Construction, Real Estate, Environmental Studies, Public Health and Public Administration, you will find about 2,000 to 2,500 titles which could be considered relevant to our subject. The research worker or planner will see at most 10 to 20 titles, indeed Brenda White found in 1970 that the average planner scans regularly six or less journals[3]. Add to this the amount of monograph material, published and semi-published, and we certainly have an 'information explosion'.

A good abstracting service can help the busy worker to cope with this. It can help him to absorb, relatively painlessly, some of the vast amount of literature published. It can alert him to important research findings and useful information that he would otherwise miss. In some cases, having read the abstract, he will want to see the original article, but in many cases a good abstract will save the time he would have needed to read the original.

Secondly, a good abstracting service will exploit the parent collection. The stock of a library which does not move off a library's shelves, either for loan or reference, is a dead collection, and a very uneconomical dead collection. The more stock is used, the lower the unit cost is of each item in that stock—in other words costs go down as use increases.

Thirdly—a good abstracting service will include a certain amount of 'fringe' material; it will recognize the value of browsing and serendipity. It will give a bird's eye view of what is happening in a speciality as a whole, and in fringe subjects touching on that speciality. If it is basically an in-house service, it will give an overall view of the activities and interests of the organization as a whole. In the Civil Service for example, an officer who specializes in water supply one day may move on to consider the finances of new towns the next. Surprisingly, according to a recent British Library Research and Development Report on SDI Services, there is a tendency for people to continue to be interested in their original speciality long after they have moved on to another field[4].

Fourthly—a good abstracting service will be exploited retrospectively for information retrieval and this you may consider to be its most important function—to provide information quickly through its classified arrangement, and especially through its indexes, on any relevant subject.

Fifthly—a good abstracting service will provide a mini-catalogue of recent material, and if sets are kept and properly indexed it can be used as a catalogue for those readers who have no easy access to a library.

Sixthly—a good abstracting service can be repackaged, either before or after printing, to provide an SDI service, a bibliography, a state of the art review, or as input to a larger national or international data base. For instance, in our case we supply the British national input to the European Conference of Transport Ministers' data base on transport economics, in Paris, as an automatic part of our abstracting service production cycle, and we operate an internal Selective Dissemination of Information Service, again as part of the production cycle.

To sum up—the service should attempt to cope with the information explosion; it will help to save the time of the busy reader by drawing attention to important research and development in his field of interest; it will exploit the literature; and it can transform a little-used collection of documents into a busy information service; it will give a bird's eye view of a subject area; it will help the reader who has no direct access to a library; it will help to provide information quickly by good indexing and arrangement—and lastly it will raise the users' valuation of the library service as a whole.

What the ideal abstracting service should provide

What should the ideal service give in terms of coverage of the literature, currency of information, presentation of information and back-up services?

It must be relevant. It should attempt to include all the important articles from the main planning journals published during a specified period.

It should include relevant articles on subjects from unlikely journals—those journals which are *not* likely to be seen by the reader. For instance some of the banking journals contain useful statistical information—information, perhaps not primary information, but usefully packaged, which is not likely to be seen by the regular reader.

It should include books, reports of all sorts, particularly those not published commercially, government publications, local authority publications (structure and local plans being particularly relevant).

It should be selective—and that means in the case of the *DOE/DTp Library Bulletin*, restricted to some extent to British planning experience and practice. If this seems a little insular my defence would be that selection does enable one to see the wood from the trees—a little pruning is sometimes necessary. For instance, some material on American national parks can be relevant to British national parks, in which case we would include it in our *Bulletin*; some material—because of differences of size, scale and administration is not—and while this may be included in our library catalogues we would not include it in our *Bulletin*.

The service should also be current, or reasonably current. There is a value in older material in a library catalogue or in a bibliography—there is little value in a current abstracting service where the emphasis should be on *new* development and thought. The time gap between publication of the original and publication of its abstract should be kept to the minimum.

It should be regular, so that the user knows when to expect it, be it monthly, fortnightly or weekly. From the production point of view the editor must work to a regular pattern of allocating work for abstracting, receiving the finished products from his regular contributors, editing and arranging them, and making sure that the copy he gives to his typist, printer or publisher (depending on the degree of sophistication of the production) is as near perfect as possible, since corrections cost money.

The finished product should be legible and attractively presented: It should allow the reader to scan rapidly without eyestrain. It should not be so long that it deters all but the most committed reader—and of course it should be well written. The journal should have a helpful and readily comprehensible arrangement for the reader. The librarian may cope happily with the more esoteric classified arrangements—the reader may well give up. Ideally, it should contain a list of journals abstracted. It must have retrospective value and here indexing comes to the fore. A mini-index can be useful in each issue, particularly if each issue contains several hundred abstracts. Annual and/or cumulative indexes are essential for subsequent retrieval. There is a need for a consistent and controlled indexing vocabulary.

If possible it should have a back-up service of original documents. There is nothing more frustrating for the reader than to have his appetite whetted for an item which subsequently proves to be unobtainable. It is difficult for libraries, particularly in times of accute staff shortage, to cope with outside loans, but most libraries, my own included, will still try to help with difficult-to-obtain publications. The abstracting service should of course provide the fullest bibliographical details, including addresses, from which publications may be obtained, so that users may trace and borrow publications through BLLD and inter-library loans services.

The good abstract

What about abstracts themselves? Collison[5], whose work on abstracting and abstracting services can be commended as one of the few useful works in this very neglected field, says 'an abstract is the terse presentation in as far as possible the author's own language, of all of the points made, in the same order as in the original piece of primary documentation—and that can be a book, a research report, a periodical article, a speech, the proceedings of a conference, an interview etc—it is intended to stand as a readable and complete item in its own right and is therefore a separate work of scholarship that can be fully indexed and exploited for the benefit of scholars and research workers'.

That then is the ideal—which all those of us who practice the craft try to meet—though all of us break the rules all the time. There is not time today fortunately or unfortunately to go into the details of the techniques of abstracting, fascinating though these can be. There is very little literature on the subject. Collison can again be recommended. Many organizations such as the Cement and Concrete Association, and my own library have developed in-house codes for abstractors which are practical guides to some of the thorny problems the abstractor encounters. On the esoteric arguments, dear to our hearts, on indicative of informative abstracts—it is enough to say in passing that there is a place for both, depending on the original article.

Current abstracting services

I would like to mention some of the services presently available.

First the Greater London Councils' *Urban Abstracts*, published monthly, containing periodical articles, selected reports, books and pamphlets received in the Research Library of the GLC, covering literature of relevance to metropolitan areas, particularly London local government. Major topics include housing, environment and pollution, social services, construction and management, public transport and urban problems. This is a very legible production, in a two-column layout, with a sensible arrangement outlined in the contents lists at the beginning of each issue, costing £21 for 12 issues. The GLC Research Library also produces a *Boroughs Intelligence Newsletter*, monthly, drawing attention to research being carried out in London Boroughs, with names of contacts, telephone numbers etc. and a *Daily Intelligence Bulletin* soon to be available online to those who have access to a terminal.

Second—the Royal Institution of Chartered Surveyors *Abstracts and Reviews*, published monthly and intended for Chartered Surveyors but with a much wider interest, covering building and construction, compulsory purchase and compensation, conservation and the environment, housing, estate management, land, landlord and tenant, mining and minerals, planning and development, rating and valuation etc. As well as abstracts, useful statistics on such subjects as farm sale prices, construction indices, agricultural wages etc, are included and attractively and readably presented. The RICS also produces a *Weekly Briefing* which is a digest of news selected from the press. With the *Municipal Journal*, a digest of new legislation is also produced. The abstracting service costs £25 a year to members of the RICS, and is available to non-members for £55. A back-up service of photocopies at 12p a page, plus a handling charge is available.

Among the commercial services *Urbandoc News*, compiled each month by Capital Planning Information, gives a selective listing of recent documents relevant to urban planning and management, with a digest of developments in urban documentation. Coverage is mainly of United Kingdom material, with a selection from overseas. Subscription is £15 per annum.

Another commercial services is *GEO Abstracts*, published in seven parts, each appearing six times a year, by the University of East Anglia; the parts being: (a) Landforms and the Quarternary; (b) Climatology and Hydrology; (c) Economic Geography (d) Social and Historical Geography; (e) Sedimentology; (f) Regional and Community Planning; (g) Remote Sensing, Photogrammetry and Cartography. The annual subscription is £98, each part is £14, the most useful to planners being (c) Economic Geography and (f) Regional and Community Planning. Author and regional indexes for each part appear in the last issue each year, and there are annual and cumulative indexes available in computer print-out for an extra charge. Each issue has a useful contents list which explains the arrangement, and the abstracts are authoritative, usually being authors' abstracts. The layout is reasonable, though the typeface is a little small for easy reading.

A very useful up to date specialist service comes from the Property Services Agency. *Current Information in the Construction Industry*, fortnightly, covers such topics as accidents, architecture, building materials, civil and structural engineering, building design, fire, flood and coast protection, special types of buildings, tunnels, mechanical and electrical engineering etc. It is classified by UDC, with a contents list key to the arrangement. As well as abstracts, a list of meetings, conferences, courses and exhibitions is included. CICS has a double column layout and is easy to handle. Current Information is on subscription for £15.50, and *Construction References*, which is the annual volume, costs £11.50 a year.

A useful weekly service is the *Planning Exchange Bulletin*, arranged in six sections, covering planning, housing, transport, social services, economic aspects and local government. It includes reports, structure plans, conference proceedings and some periodical articles. Items are available on loan, and photocopies of many items are available at 5p a sheet. There are varying grades of membership for different kinds of organization, but it is possible to subscribe to the Bulletin without being a member, for £30 a year. It is not as yet a very comprehensive service, but one which is growing and which contains much monograph material not readily found elsewhere.

The Planning Bulletin of the Town and Country Planning Association, also a weekly service, contains extracts, rather than abstracts, from the national press and some weekly journals. It includes notes on new books, details of conferences and courses, and is available to non-members for £13 a year. The subscription now also includes, with every fourth issue of the Bulletin, a supplement called *Planning Aid*, produced in assocation with the Royal Town Planning Institute, covering information and comment on planning aid in practice.

Mention should also be made of *LOGA*, the Local Government Annotations Service, a cooperative venture sponsored by the Association of London Chief Librarians, and with contributions by nine of the London Boroughs. LOGA is issued bi-monthly, with a subscription of £3.30 per annum. It covers the whole range of urban topics from Airports to Youth Employment. Unfortunately the range of periodicals is rather limited—mainly weekly ones, but including the Guardian, Financial Times, Telegraph and Times. It is neatly produced and readable, but it does tend to be very out of date. However if you do have to cut your annual subscription to some weekly journals, and do not mind too much the lack of currency, LOGA may fill a need.

For those interested in the organization, administration, structure and new developments in the water industry, the *National Water Council Bulletin* can be recommended. A weekly service, it is nicely produced, clear and legible, costing £34 a year, giving notes on publications, parliamentary summaries, European community information, notes of new legislation, British standards etc, together with abstracts of papers and periodical articles. It does not cover the literature of scientific, technical and engineering aspects—for these the Water Research Centre's *WRC Information*, published weekly at £50 a year fills the gap.

Another service, a little outside our immediate terms of reference, is the CAB (Commonwealth Agricultural Bureau). There are now about 50 abstract journals coming from the CAB data base, which is also available online. The interesting one for planners is *Rural Recreation and Tourism Abstracts*, quarterly, at an annual subscription of £23. This includes such topics as countryside planning, second homes, recreational use of reservoirs, national parks and many others. The emphasis is on world wide information covering about 150 countries, not just, as the title implies, the Commonwealth. The abstracts are authoritative, from high quality journals, books and reports, and there are detailed indexes. There is a document delivery service though at present there are some problems with this. It is well printed, though unfortunately rather out of date. However for difficult-to-trace minority language material, where a good abstract is a substitute for the original, CAB is hard to beat.

Finally, our own *DOE/DTp Library Bulletin*—a fortnightly publication giving abstracts of periodical articles, books, reports, conferences etc, covering current literature on social and environmental planning, roads, traffic and transport, countryside and recreation, housing and local government, water supply and waste disposal. Each Bulletin contains between two and three hundred items, which makes it one of the biggest services. There is a contents list which describes the arrangement, and a mini-index in each issue, together with a list of titles of journals included in that issue. There are annual Name and Subject Indexes, now up to date. Also included is a *Monthly Supplement* of new legislation, acts, bills, statutory instruments, circulars etc and new publications of the Departments, both those published by HMSO and those, much more difficult to obtain, published directly by the Departments. The subscription of £48.96 a year, including postage, also entitles the subscriber to a free copy of the Annual List of Publications, which includes DOE/DTp publications, together with those of the research establishments, and related organizations like the Countryside Commission. The Library does enter into exchange agreements with other libraries and organizations—the Bulletin in exchange for publications on a *quid pro quo* basis.

These then are some of the services which are available to be exploited, and which will give good returns for the money spent.

AUTHOR'S NOTE

The views expressed are those of the author, and do not necessarily reflect those of the Departments of the Environment and Transport Library Service

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ACOMPLIS: a computerised London information service

Penny Farmer
GLC Research Library

Paper presented at the ATPG/RSIS seminar, London, Library Association, 6 November 1980

I HOPE THAT some of you may already be familiar with the name ACOMPLIS. This bibliographic database of urban information was established in 1973 by the GLC Research Library, which was at that time part of the Intelligence Unit of the Department of Planning and Transportation in the Greater London Council. Seven years later we are about to move into a new era as the system becomes available as an online information retrieval service.

The Research Library is still in the Intelligence Unit, but has taken a more central role in the provision of library and information services throughout the GLC. This is reflected in its relocation in the Director General's Department. The coverage of the database reflects the need to provide information across the whole spectrum of local government activity–finance, employment, industrial development, planning, engineering, recreation and leisure, flood-protection, civil defence, housing strategy, transportation, waste disposal, air pollution, the list is very nearly endless. The Greater London Council is a strategic authority and changing emphasis will occur as for instance responsibility for housing passes to the London Boroughs, the Channel tunnel is or is not built, Maplin comes and goes and so on. Yet our own responsibility does not really end within the strict criteria of strategic responsibility. We are required to make provision for information collection and dissemination to all involved in the government of Greater London—and other bodies and local authorities who have an interest in urban problems. It is hard to draw the line at London-based literature when comparative experience will have a bearing not only on us, but on other cities of similar size.

It was in this spirit of communication—of sharing a resource, avoiding duplication of effort and offering a sophisticated information retrieval service on the lines of that already existing in science and technology, that ACOMPLIS came into being. Initially set up to coordinate research, both continuing and completed in a unique common source, as well as to include the information acquisition and disseminating activities already being carried out by the library.

Activity in the Research Library has always been geared to the 'industrial' special library approach of taking the information to the customer rather than waiting for the customer to approach the service. In effect this approach only worked on the information service side of the operation which scanned and abstracted the journal

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literature and the press information. Dissemination of journal literature took the form of a monthly abstract bulletin, ***Planning and Transportation Abstracts.*** But new accessions lists were the only active attempt to alert customers to their specific interests, in the book and pamphlet literature. Library bookstock was traditionally catalogued and classified by UDC; however one concession to progress, a KWIC index package, was used on titles of pamphlet material which was not classified but shelved in a running number sequence. So much of the stock of the library was of this type, that this offered a quick solution to the problem of filing. It was necessary to integrate these activities. Too many systems were operating. Traditional retrieval methods were time consuming and inflexible. The sort of in-depth indexing which would retrieve specific material containing for example bus-lanes in Tower Hamlets, could not be met by traditional methods.

The logical step was therefore to continue the pattern already set and introduce a mechanised information retrieval tool which would provide SDI, and alleviate the considerable problem of retrospective searching. No other attempts were being made to actively acquire and process documentation in this way in the notoriously 'soft' field of planning information and the creation of ACOMPLIS was an attempt to fill the gap which had already been proved to exist and resulted in all these in-house activities already being carried out by the Research Library.

After various trials a decision was made to purchase a software package, ASSASSIN (Agriculture System for Storage and Subsequent Selection of Information) developed by ICI Agricultural Division. This was chosen because it offered a natural language retrieval system but allowed for extensive synonym control. A full text online storage system such as STAIRS was rejected as prohibitively costly and it could not provide a subject and author index as ASSASSIN could, to replace the conventional card catalogue. Interestingly STAIRS is now being considered viable for other text storage applications in the Council. The decision to opt for natural language retrieval obviated the necessity for creating a structured thesaurus and allowed the specific retrieval of such concepts in the literature as 'gentrification', 'homesteading' and so on. The minimising of intellectual effort at the indexing stage, the machine automatically indexing 80 per cent of keywords in the title and abstract, can however create more at the retrieving stage. Although it is argued that recall is just as satisfactory with a natural language search a 20,000 word vocabulary index to a database of 80,000 references is now creating problems. In principal the natural language concept works very well as long as synonym control has been properly carried out. Unfortunately with so much of the vocabulary frequently changing it is often difficult to realise that one thing, for example 'middle class—reentry' or even 'displacement' in fact means another, 'gentrification'. However the trend is certainly away from controlled indexing in information retrieval systems generally. Unfortunately it does have drawbacks in such disciplines as ours where the vocabulary is notoriously fluid.

The products of the system are a KWOC index, SDI, and batch searches using either Boolean or weighted logic. Material is allocated to different source codes either describing the type of material, for example report literature, theses, or another library's stock. Indexes can be created by word type, for example author or keyword; or by type of document, for example bibliography.

The ACOMPLIS database allows one processing procedure for all documents received in the library. All the journal articles that are selected, all the books, pamphlets, reports literature, legislation etc. are entered onto the database on a standard input form which incorporates standard cataloguing details plus an indicative abstract and added keywords. A series of programs automatically indexes each reference by the keywords in the text, and personal and corporate authors. At present ACOMPLIS contains 80,000 references from over 800 journal titles, including all the major English language journals in the fields of planning, transportation and local government, TRRL reports, GLC Research Memoranda, as well as the normal library book stock; we even include thesis material from, for example, Oxford Polytechnic. One deviation from the original concept is the removal from the database of 'research'. At one time active research being carried out by the London Boroughs was included. Unfortunately there was no program available at that time for deleting projects which were no longer active, or for adding to the existing entry, and this resulted in much out of date information being retrieved. Our conclusions now are that ACOMPLIS as we use it is the wrong vehicle for that type of 'open-ended' information.

The suitability or otherwise of including certain types of information on ACOMPLIS has been the subject of much debate and trial and error over the years. The system was designed to operate in batch mode and frequency of updating, currency of data and feasibility of deletion are all factors which have had to be taken into account. It may be the case that the system will work satisfactorily to process the information but will the end product necessarily be any more useful to the customer? For example our Daily Intelligence Bulletin of newspaper cuttings needs to be instantly retrievable and long term storage may be questionable. We have found that selected items included in the database have merely served to confuse and have caused problems of backup. We are considering a number of the full-text processing systems now becoming available to see whether these will provide the answer.

Let us now come to the events of the last year. The early software package used to create ACOMPLIS has been modified, and in many ways improved although there are operational difficulties in house at GLC. However conversion to ASSASSIN Mark V, the latest version, has allowed us to make the database available for on-line interactive searching. We are under contract with Information Retrieval Services (IRS) based at the European Space Agency in Frascati, Italy who are acting as hosts. In the New Year if all goes well the database can be accessed in this country through Dialtech. It will also be available directly via Euronet and will therefore be available throughout Europe.

It will be the only English language online database with such a wide coverage of urban documentation. From the United States for example the PAIS (Public Affairs Information Service) and that of NTIS (National Technical Information Service) can usually provide some relevant information for planning and urban affairs but naturally with almost exclusively American bias. Other urban documentation services are planned in Europe, for example URBAMET on Telesystèmes, and there is of course already the ORLIS/RSWB database produced by the Informationsverbundzentrum RAUM und BAU on INKA, French and German respectively. ACOMPLIS begun in 1973, offers a unique cumulation of material drawn from many sources. Not only journal articles as in so many databases, but books, reports, pamphlets, in fact our whole stock. The coverage includes much material selected from American sources which is not available through any other online services. The transportation field is only covered reasonably well by NTIS, but the new TRIS (Transportation Research Information Service) file on Dialog is only available in the US and Canada. ACOMPLIS should certainly help fill that very important gap in the online information retrieval sources for transport.

Of course we are very excited at the prospects of having ACOMPLIS online. Charges will be in the region of $65 an hour and 15 cents per printed record. The Research Library will receive royalties from IRS. However online ACOMPLIS or ACOMPLINE as it will be called is not the only part of the Research Library's service. The other products of the system are valuable in themselves. Copies of the KWOC index which we run on 16mm COM film and which acts as our author/subject catalogue we make available on a subscription basis. We can carry out batch searches in house which are usually available within 24 hours. We produce our monthly abstract bulletin *Urban Abstracts* from selective input to the database. Being selective it represents only about 50 per cent of our monthly additions to the catalogue, however it provides a readable current awareness tool which allows, as SDI profiles so often do not, a unique 'browsing' capability.

This brings me on to the question of what is included in the database. Our experience with *Urban Abstracts* for example shows that more and more subjects are being covered in response to local government information requirements. We are considering dividing the bulletin into two parts, covering possibly management, social planning, education, housing in one and transport, environment, pollution, energy etc. in the other, in an attempt to make it more manageable. As we have become the central resource for such departments as personnel management, management services, architects, scientific branch and so on our responsibility for exceeds just planning and transportation. ACOMPLIS is as much a housekeeping facility as an information resource. Whatever altruistic motives may have been argued at the time ACOMPLIS has been developed as an entirely pragmatic exercise in staff economy. It has released very considerable resources for developing other ways of meeting customer needs, one particular example is the tailor made digest or literature review on such topics as enterprise zones, citizen's band radio and urban development corporations. Far more valuable than mere lists of references.

How will going 'online' affect our policy in the Research Library? Will management of a publicly available database cause us to try and tailor ACOMPLIS to what we think our new customers expect? We will only be making available material from certain source codes, mainly book pamphlet and journal material which should be available through interlibrary loan from the British Library. However, I'm not counting on it. So much of our stock is of the kind produced in short publication runs by obscure pressure groups and societies often based in someone's back bedroom. This type of thing has always caused problems. Similarly we have acquired many documents which can really be regarded as unpublished, departmental reports from other local authorities, committee documents and so on. We have no resources to offer back-up facilities for material retrieved. It will be interesting to see what effect online access to this type of documentation will have on those whose job it is to provide interlending facilities.

What we hope is that people will recognise what a unique source of urban documentation ACOMPLIS is. Because we have responded to a real live local authority's needs, the database reflects the incredible range of information required for good local government. It is not my place here to say whether that information is used well! Let me close with an example which illustrates the unpredictable nature of ACOMPLIS. There is one novel on the database. It is called 'Deluge' and is a thriller all about the flooding of the Thames. Very exciting, and a very accurate description of what might happen, which is of course why we got it. I hope we have indicated that it's a novel in the abstract, but at least that document should be readily available on interlibrary loan.

AUTHOR'S NOTE

The views expressed in this paper are those of the author and not necessarily those of the GLC.

Information for urban and regional planning—the European dimension

Gay Scott

GLC Research Library

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WHEN ONE CONSIDERS the extent of the subject—urban and regional planning and then multiplies that by the number of countries that there are in Europe, it will be apparent that the task of keeping track of all relevant information is a gargantuan one. Indeed any attempt to define urban and regional planning leads to all sorts of difficulties; likewise how is Europe defined? to some it will mean the European Communities; to others the Council of Europe and to a third set of people, the Organisation for Economic Co-operation and Development—which of course is not solely European at all now that it extends its membership to Canada, the USA, Australia and New Zealand. In order to define an area for the purposes of this seminar, I am going to tell you how one large urban authority—the Greater London Council, attempts to keep itself informed about issues within *its* European horizons.

For some three years now, the GLC has formally attempted to keep abreast of European information in all its fields of interest; further than that the Council has also participated in European affairs whenever it was felt to be justified. Before that time, of course, individual members and officers represented the Council at important European level meetings and European issues were presented at Committee meetings from time to time. But it was the increasing awareness of the implications of the United Kingdom's membership of the European Communities which lead to the establishment of a small unit with two staff working full time on European issues. This office, situated in the Central Policy and intelligence Unit of the GLC, is charged with the task of co-ordinating European matters for the Council as a whole. In addition an information officer was appointed to the staff of the GLC Research Library, with specific responsibility for collecting and disseminating European information.

Given the limited resources available, a decision was taken early on that the emphasis of the European work would be on that emanating from the European Communities. The reasons for this were pragmatic. The European Communities have executive powers which affect government in the member states both at a national and a local level. Indeed European Community legislation is often more apparent in its effects at a local level because it is the local authorities which actually implement much of the EEC legislation.

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The aims of this Unit are as follows:

1. To monitor European issues and to report on those of relevance to the Council.
2. To attempt to influence policy as a European level in the best interests of London.
3. To attempt to secure European Community funds wherever possible.

The degree of success must eventually be measured in terms of each department of the Council considering European issues in the same way as they would naturally consider national or local issues. This process is a gradual one and, is influenced by political events perhaps more than by administrative efficiency.

This then, is the background to our day-to-day work. As experts in the information field, you will perhaps be most interested in how we keep ourselves informed and how we in turn inform our colleagues. First of all I would distinguish between two types of information—formal and informal. Formal information is published; it is abstracted and indexed to varying degrees. It is reported, recorded and acted upon. At one extreme, in the European Community sense, formal information consists of legislation—at the other extreme press reports, consultation documents and proceedings of seminars and conferences. Such information, when organised properly, is valuable in both a current and retrospective capacity. Access to such organised information is certainly necessary in order to achieve any of the objectives of the GLC, in this field, which I mentioned earlier.

The second type of information is informal. By this I mean the information which is assembled as a result of informal, day-to-day contact with the European Community institutions, whether it be by telephone, by letter or by exchange of visits. It is the kind of information which emerges as a result of discussions with other interested bodies, from civil servants in Government departments, to professional associations, research institutes, academic bodies and, of course, political parties. It is far less tangible, scarcely recorded and, potentially, far more valuable. However. I do not think that it is valuable unless you also have access to the formal information. For many scholars and historians such informal, current information may be deemed unnecessary; but for the policy makers—for those who wish to influence events, it is vital.

In the GLC we find it necessary to keep track both formally and informally. We need to know, for instance, the final draft of a Commission proposal when it is referred to the Council of Ministers for decision. We would also hope to know the attitude of each of the nine member states, including our own government; the degree to which the Presidency of the Council wishes to promulgate the proposal; the attitude of European Parliamentarians and of the three groupings in the Economic and Social Committee; the opinions of industry and of national parliaments; professional interests and finally whether there are likely to be any 'trade-offs' in the Council of Ministers, against other outstanding, unresolved proposals. This kind of information is not easily acquired; on the whole it's acquisition depends upon the existence of a network of contacts which has to be continually nourished to keep it alive. Every information officer will have his or her own network of contacts and will understand the importance of this aspect.

It is not within the scope of this paper to give a systematic description of all the relevant sources of European Community documentation of the formal variety. For this, I would refer you to three publications:

1. JEFFRIES, J. *A Guide to the official publications of the European Communities.* Mansell, 1978.
2. PALMER, D. M. *ed Sources of information on the European Communities.* Mansell, 1979.
3. SCOTT, G. *The European Economic Community; a guide to Sources of information.* Capital Planning Information, 1979.

I think that, between them, these three publications give a good indication of what you should be looking at to keep up with sources of European Community information.

What I would prefer to do is to take you through each of the publications which my unit examines regularly and try to weight their importance and their usefulness. I will start with 'COM' documents—'COM' is short for Commission and 'COM' documents are produced by the Commission for the information of or for decision by the Council of Ministers. Without 'COM' documents we really would not have very much to do because they represent the whole range of Commission business both in the initiation of new proposals and in the administration of existing policies. You are probably familiar with the process of policy-making and formulation of legislation in the European Community. It is described in Section 2 of the CPI publication which I mentioned earlier[3] and in the excellent booklet prepared by Emile Noel, the Secretary-General of the Commission, entitled *Working Together.*[4] This is obtainable free of charge from the Commission's London Office at 20 Kensington Palace Gardens. A very straightforward graphical account of the institutions of the Community and how Community Laws are made is given in *the 'European Community—Who? What? Why? How? and where Does Britain fit in?* Which is published, again free of charge, by the London Office[5].

To simplify the process of how Community Laws are made basically the Commission formulates a proposal. This proposal is sent to the Council of Ministers for decision, and to the European Parliament and the Economic and Social Committee for information. The Council of Ministers asks for the opinions of Parliament and the ECOSOC and, if necessary the proposal is amended in the light of these opinions. At the same time National Parliaments will also consider the proposal. Commission proposals appear in their final draft form as a numbered document when they are referred to the Council of Ministers. They are produced in all six languages of the Community, on recycled paper in mimeographed form. The English colour for the cover of these documents is pink—as with all English Language translations or documents which the Community prepares. All legislative proposals also appear in the *Official Journal of the European Communities* in the 'C' Series, '*Information and Notices*'.[6] I would say, however, that the 'COM' documents are more useful insofar as they contain explanatory memoranda, and of course, many 'COM' documents do not appear at all in the *Official Journal.*

It should be pointed out that before 'COM' documents arrive at their final draft stage, that they may have been through many preliminary drafts. To give you an example the Common's current proposals for Environmental Impact Assessment, have been through something like 20 drafts over a period of two years. That may not be a typical example but it is an interesting one, because the preliminary drafts, in their later stages, were leaked on a fairly wide basis. That is unusual. It is normally quite difficult to obtain preliminary drafts unless you are part of the official consultation procedure.

It is fairly easy to keep track of new Commission proposals by reading the list which appears in *British Business* in the section 'European Community News'.[7] This list forms part of the 'New Documents' section, which contains references to Community draft instruments and consultative documents deposited in the House of Commons. These are all available for consultation at the European Commission's London Office. Sometimes they have spare copies which they can distribute. To keep track of 'COM' documents, an excellent check list appears in the form of the *House of Lords Select Committee on the European Communities' Report on Progress of Scrutiny*, although, unfortunately they do not give the 'COM' no.[8]

I mention these two documents in particular because the *Commission's own catalogue* does not list 'COM' documents—probably because they would not officially constitute the term 'publication' in the Community sense.[9] What it does give is a classified list, together with titles and series indexes, of monographs and series which are for sale by the Office for Official Publications. It is a little confusing to use because it is a multi-language edition. It can be obtained separately or it forms a supplement to the Bulletin of the EC.

I ought to mention at this stage that all Commission proposals and working documents are recorded on *CIRCE*—the Commission's own internal data base which is not available for public use but which will become available to the staff of the London Office from 1981 onwards. CIRCE will eventually bring together *CELEX* and *ECDOC* to offer completely automated files—ECDOC consists largely of internal documentation and CELEX consists of Community Law. CELEX does have a definite public dimension and will be accessible as part of Euronet.

I have spoken of 'COM' documents as our basic work and I have tried to indicate how to keep track of them. It will still be necessary to examine the *Official Journal* to read new Community legislation, as opposed to legislative proposals, and these appear in the 'L' series. The 'S' series of the OJ is of particular importance to local authorities who are obliged to advertise supplies and works contracts over a certain value, and also, hopefully, to industry who will be able to see the opportunities for tender. I personally find the 'S' series to be of great interest. Where else would one find a call for tenders for 42,240 drawers, mens, long olive drab?[10] Other official publications which we examine regularly are the *annual report on the Activities of the European Communities*[11] and the *Programme of the Commission for the current year*[12]. This is to find out the general plan of activity and what has actually been achieved.

As regards statistics, we keep up with '*Eurostat News*' and use individual statistics as necessary. I would particularly recommend that you read the No. 1 issue for 1980—It is a quarterly publication—because there is a very good explanation in this issue of the planned improvements in Eurostat publications and a very good guide to the classification and colour codings for the individual statistics. One other official publication which has a large statistical content which we monitor regularly is '*European Economy*'—extremely informative and well produced, it is published three times a year.[14]

There are, in addition, some annual reports relating to specific areas of community operations such as the *Annual Report of the European Regional Development Fund*[15] which we find it necessary to read. These do appear as 'COM' documents in the first place and are reprinted as glossies when they have been approved by the Council of Ministers. One final official publication which is very useful, in that it gives an overview of all Community activities is *the Bulletin*.[16] It contains Special Features; Activities during the month and documentation. Unfortunately, it is always a long time getting into print.

I would like to leave aside official publications and go on to talk about some commercially published ones together with some of the Community's more 'newsy' productions which I could not really count as official. For keeping up to date with current issues there is one outstanding publication. It is entitled *Europe*[17] and it is published every weekday in Brussels by L'Agence International D'Information Pour La Presse. It is translated into English from the French and it is also published in Italian and German. If I had to make a choice of the one single publication which I would read if I could read only one, it would be *Europe*—both for its content and its currency. I can only repeat the cliché that it is said to be read by Community officials in order to find out what is going on in the Commission! It is a strange publication to read—the style is a mixture of informative but chatty accounts of all the various activities in the Community institutions, together with lofty and grandiloquent pronouncements on the 'European idea'. Agence *Europe* is indexed in *Eurosynt* which is published monthly and is available on a separate subscription from the same address.

Community Markets[18] is a monthly briefing for businessmen on European Community developments published by the Financial Times. Current publications which are informative but more literature based include *Common Market Signposts*[19] a monthly check list of all EC developments and related documents under classified headings and the *European Digest*[20]. The *European Digest* is published by the GLC on a monthly basis and is now available on subscription, at £20 a year. Its chief value lies in the wide range of source documents which are referenced which include the daily press, the weekly news publications such as the *Economist*, *Europe* and a range of professional and technical journals. The *European Information Service*[21] aimed at all local authorities and published by the IULA/CEM British Sections is a similar kind of publication but concentrates on just a few sources, with lengthier items written upon these. It is distributed to all local authorities in the UK.

I would just like to mention three Commission publications which are very easy to read and rather fun. *European Community*[22] published monthly by the London Office is intended to give a concise view of current Community affairs and to stimulate discussion on European problems. *Euroforum*[23] published in Brussels, by the Commission, in English is published with journalists in mind and gives an informal account of Community activities. *European File*[24] which commenced in 1979 is published monthly by the Commission in Brussels and each issue covers a specific subject, which it is intended will progressively make up a complete file on the problems of Europe.

Finally, I mentioned to you that one of my unit's responsibilities is to keep track of EC grants and loans and to take advantage of these wherever possible. I have recently published a *Guide*[25] to these because at present there is not any other single publication which draws this information together, although a publication called *European Brief*[26] by Gregg Miles does cover the major financial instruments.

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AUTHOR'S NOTE

The views expressed are the author's own and are not necessarily those of the Greater London Council.

Letter to the editor

ONLINE COST-EFFECTIVENESS

Let us accept Professor Lancaster's contention[1] that comparisons of online with print searching should include effectiveness as well as cost, and that failure to do so may improperly favour print. Leaving this main point intact must we also accept his contention that 'the appropriate cost-effectiveness measure to use in the comparison is the cost per relevant reference retrieved'? Who defines what is relevant, and why is more of it necessarily better that less?

An effective search could be credibly defined as one which produces the information—no less and no more—that the user wanted. An alternative approximation, still far from ideal, would be to define effectiveness in term of the number of references retrieved which are read and found useful by the end user.

Neither of these would help much, unfortunately, with a successful search producing no references, nor with those which produce wholly unanticipated results requiring rethinking of the question—but at least they would come closer to real value than 'relevance'.

The objectives of a search may vary as much as its subject matter and approach, but even a definition of effectiveness in terms of objectives has a variety of weak points.

Perhaps the most sensible way to look at this issue would be simply to ask a few of the people who are doing both types of search on a day to day basis, yet even this may be fraught with difficulty. I don't know much about other fields, but many medical librarians certainly use Index Medicus almost daily both in print form and online. Although they find little difficulty in deciding which searches to carry out in each mode, most of them would find the blanket questions 'which is more effective? or less costly? or more cost-effective?' impossible to answer if not actually meaningless.

Could that be an indication that both Collier and Lancaster are not so much asking the question in the wrong way, as asking the wrong question altogether?

M. J. Carmel
Regional Librarian
South West Thames Regional Library Service

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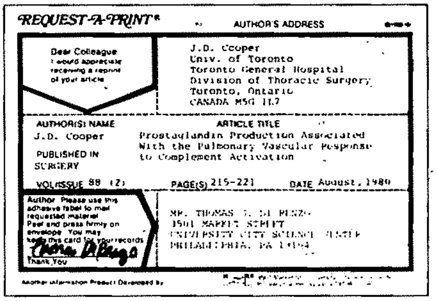

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Towards a Code of Professional Ethics

Bob Usherwood

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Sheffield

Chairman, L.A. Working Party on Professional
Ethics

Paper presented at an Aslib Evening Meeting, 28 January 1981

AT THE RISK of sounding like an over-cautious civil servant I should make it clear that any opinions or interpretations I give in this paper are mine and not necessarily those of the Library Association. The Draft Code of Professional Ethics[1]—the green paper that appeared in the October L.A.R.—is not yet L.A. policy. Indeed as far as our members are concerned, the consultation that is now taking place is an integral part in the formulation of a code of professional ethics. It is my privilege as a Chairman of the Working Party to listen to, and respond to members' views and then to communicate them to our working group.

The British library and information world has come rather late to the question of professional ethics. Our American colleagues first developed a code for librarians in 1938 and the topic has been regularly discussed there ever since. In Britain it was not until 1962 that Douglas Foskett produced '*the Creed of a Librarian—no politics, no religion, no morals*'.[2] Some eighteen years later Charles Oppenheim and B. J. Kostrewski published their paper on 'Ethics in information science'.[3]

Two years before, in January 1978, at a meeting of the Library Service Committee of the Library Association, it had been suggested that a paper should be produced outlining the areas that would need to be discussed in formulating a code of professional ethics. I was subsequently invited to prepare that paper.[4]

At that time I identified six areas where I felt there was a need to develop rules to safeguard the standard of service provided to clients, and also to regulate relationships within the profession. These areas of concern were:

(1) The competence of the librarian
(2) The question of discretion and respect of a client's privacy
(3) Professional independence and intellectual freedom
(4) The impartiality of the library profession
(5) Financial ethics
(6) The integrity of members

I should like to deal briefly with each of these in turn.

1. *Competence*

It is in the interests of the public and the profession that members of the library and information profession provide, and are seen to provide, a competent service. There

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is a need to monitor the performance of those entering and practising the profession. The L.A. already has rules regulating admission to its Charter, and a degree of control over syllabuses and examinations. There is also a procedure regulating certification—a procedure which has been somewhat strengthened by the new arrangements starting this year.[5]

However, there are no formal rules regarding the continued competence of a librarian after admission to the Association's Charter. In a library and information world, subject to rapid change, I feel this to be an area worthy of investigation. The issue of competence is dealt with at length by Bennion[6] in his book on professional ethics and this section of my paper draws on ideas contained in that work.

A professional association has a responsibility to ensure that its members provide a competent service. Public confidence in a profession depends in part upon this. In some cases (for example, doctors) the State 'insists' that competence be enforced by law.

A professional body has four major tasks in ensuring the competence of its members. These are:

(1) Controlling the quality of entry to the profession
(2) Awarding professional qualifications. What Bennion terms 'The giving of the hall mark'
(3) Maintaining competence
(4) Disciplining incompetent members.

A consideration of such topics leads one to discuss the need to provide and certify continuing professional education and the need, or otherwise, for periodic re-examination of professionals. The concept of competence also raises difficult questions such as who is to be the judge of what is an incompetent professional performance, and the desirability of, and degree of penalty for, acts of incompetence. Most professional associations have been reluctant to punish incompetence—but the Institute of Chartered Accountants has brought disciplinary proceedings against members who have neglected their clients' affairs 'on the grounds that such neglect is a discreditable act'.

2. *Discretion and Privacy*

In their day-to-day work librarians and information workers may well obtain knowledge of their clients' private and personal interests. Confidential information that comes the way of the librarian may be of a nature that might embarrass the client (e.g. details of marital difficulties) or involve him or her in financial loss (e.g. details of property negotiations). Therefore there is a need to formulate rules and procedures imposing strict confidence and discretion on librarians dealing with matters of this kind.

In addition, the information held in library membership, loan control and other records may be requested by outside agencies. For example, Sir David McNee is already asking for greater police powers to examine private records. The Library Association may well wish to establish a code to guide members as to the action to be taken in such circumstances. John Rex has already suggested what the response should be in the University context. He writes:

> 'We do have a small problem of interference from the secret police. I am not alone, I am sure, in having been asked by government departments about the political activities of my former students. They (University administrators) should tell the inquirers in no uncertain terms that universities may not be called upon to answer such questions'.[7]

In Germany the intelligence service is reported to have been active in public libraries when compiling a register of so called Leftist reading. Using library records they, according to reliable press reports, kept a register of all individuals who had been identified as members of left or leftist influenced organisations or had corresponding literature in their possession.

The use of computer-based record systems increases the ease of access to such data kept in libraries and elsewhere and makes it possible by cross reference to build up a profile of a user's reading tastes, financial position, club memberships, political interests and the like. Firm guidance from his or her professional association could help the librarian resist pressure from outside agencies to release records, and also enable the library user to have confidence in the privacy of the system.

3. *Professional Independence and Intellectual Freedom*

Librarians are concerned with the free communication of information and ideas. As such they may find themselves under attack from individuals or groups who wish to subvert this professional objective.

Attacks of this kind are likely to come from four main sources:
(i) Governments (Through restrictive legislation)
(ii) Capitalist business interests (e.g. opposition to consumer information services)
(iii) Pressure groups
(iv) Political militants

As a professional, a librarian should adopt a position independent of such interests. In addition a professional library association has a responsibility to defend its members from attacks on intellectual freedom. This is a far wider question than the much discussed topic of obscenity. In the final analysis it concerns the role of the library in the democratic process. To quote Daily, intellectual freedom 'is the foundation of professional ethics for a librarian . . . He has no choice whatever. He must either be so dedicated to the cause . . . that he will fight unendingly to preserve it or accept the status of the clerk who checks out books in the library.'[8]

4. *Impartiality*

As mentioned earlier, D. J. Foskett argued nineteen years ago that a librarian must, as a professional, have 'no politics, no religion and no morals', so 'he can have all politics, all religions and all morals'.[9]

The impartiality of the librarian is now being questioned by a significant number within the profession, particularly where it concerns the provision and especially the promotion of racist material. Many would no doubt agree with the famous B.B.C. dictum (albeit made in a different context) that 'between good and evil we are not impartial'. This of course raises a number of serious ethical considerations such as who is to decide between good and evil—and the relationship of such judgement to the concept of intellectual freedom discussed above. The question of impartiality has implications beyond that of stock selection, it can concern the provision of meeting rooms or bibliographical services. For example a document on ethics produced by the California Library Association states:

> 'Personal beliefs or biases should not influence the cataloguing or classification of materials'.[10]

5. *Financial ethics*

It is in the public and professional interest that the acquisition of library materials of all kinds should be based solely on judgements as to the quality of the goods and services provided. Such decisions should not be made on the basis of personal friendship or profit. The question of professional relationships between librarians and suppliers and their representatives is therefore one that needs to be examined. Also with the growth of consultancy activities in librarianship and information work there is perhaps an additional need to consider the matter of fees and the allied question of undercutting.

In my original paper to Library Services Committee I wondered if the Association might also consider it appropriate to restate its belief in a public library service free of direct charges on the individual client. Although this question is, and should be, the subject of separate discussion there is I feel an ethical implication in the professional librarian's belief in equality of access to information and ideas.

6. *Integrity of members*

In terms of public confidence, and in the interests of the members it is important that the standing and reputation of the library profession should not be prejudiced adversely by the actions of its members. It is therefore necessary to consider what action should be taken (if any) against a member convicted for a criminal offence. Bennion maintains that here, 'the test is whether knowledge of the offence is likely to impair the clients' trust in the offender as a professional consultant'.[11]

Many professional bodies feel that some non-criminal activities on the part of their members should be subject to a professional code of ethics. To quote Lord Reid:

> 'In every profession of which I have any knowledge there is a code of conduct, written or unwritten, which makes it improper for members of the profession to engage in certain activities in which ordinary members of the public are quite entitled to engage. Normally this is regarded as a domestic matter within the profession.'[12]

There is no question that the Library Association would wish to prescribe a code for a member's personal lifestyle. It would only be concerned with those issues that might influence the confidence of the public in the service given by the library profession.

Those of you who have read the L.A.'s draft code will be aware that it does in fact deal with all the six areas outlined above. I do not have the time to reiterate the full draft document but I should like to quote the first clause in full.

> 'The librarian's primary duty is to his or her clients, i.e. the persons and groups of persons for whose requirements and use are intended the resources and services which the librarian is engaged to provide. In all professional and administrative considerations, the interests of the client takes precedence over all other interests'.

There are many reasons for adopting a code of ethics but the most important of them is to protect the public. I believe that the work we do is so crucial that if it is carried out in an inferior way, our clients, and society in general, will suffer significantly. True the librarian is rarely if ever faced with a question of life or death. However, if we believe that the collection, organization and dissemination of information and ideas are essential to the operation of a democratic society then we must also accept that as information workers we have a special responsibility with regard to these activities. President Carter addressing the White House Conference on Libraries expressed the opinion that 'instant access to information and the calm and reasoned guidance of a qualified librarian can make the difference between the success and failure even of a life'.[13] The excesses of a politician maybe, but a significant statement nevertheless.

Many professional associations supply members of the general public with a statement providing details of standards and practice. I would hope that when the L.A. code is finalized that it too will be disseminated to the public at large. Such dissemination will inform the public of the quality of service they have a right to expect and thus provide them with a degree of protection.

Of course these days we need also to protect ourselves. In my introduction to the draft document I wrote, 'each of us can envisage circumstances in which we would welcome the support of a code endorsed by our professional association'. Response to the draft document received so far indicates that some librarians are not only envisaging such circumstances but facing them at the moment. One correspondent has written:

> 'librarians may sometimes need protection from their governing body, as much as clients may sometimes need protection from their librarians'.

In considering a code of ethics we spent a great deal of time discussing professional relationships with employers. A code introduced by the Library Association or any other professional body may not always coincide with the aims and methods of all organizations for which librarians work. The Californian document referred to earlier states,

> 'A librarian should not accept employment from an organization whose administration's policies are in conflict with the principles of ethical librarianship.'[14]

Our own draft document does not go quite that far. Where there is a conflict between the requirements of an employing organization and a librarian's professional obligation to a client we suggest the member concerned write to the L.A. stating the grounds on which the conflict has occurred. If it is impossible to reconcile such differences then the client's interest and the maintenance of professional standards must be primary considerations. There are, as our special library members pointed out, times when the client may in fact also be the employer and I would be particularly interested to hear from readers of this journal how great a difficulty they would consider this to be.

I know too that a number of public librarians are presently concerned about their professional role in largely bureaucratic structures. Some feel that the local authority librarian is these days seen as just another functionary in the local authority hierarchy. That as such, he or she is controlled by the rules, regulations and procedures of the local authority and has little of the individual autonomy that is the hallmark of the true professional. One would suggest that librarians might gain more in terms of autonomy and lose some of the external controls if the self control mechanism of the profession was developed, formulated and disseminated.

Professional librarians should not require the control imposed by the hierarchy and rules of a bureaucratic structure. The standard of public service provided should be a matter of the librarian's professional ethic and pride. This, says Martin Albrow[15] 'is the autonomous disposition of the professional, responsible to his deeply imbued professional standards for his own acts.'

While on the question of professional relationships, a number of writers have taken us to task for not including in the draft code clauses covering the professional relationships between one librarian and another. Certainly many other professional codes include statements about relationships between professionals. The Association of Consulting Engineers for example says that a member 'shall not act as to injure or attempt to injure, whether directly or indirectly, the professional reputation, prospects or business of another member'.[16] However this must not override the primary duty to the client. It is, says Bennion, 'the duty of a professional man to report to his institute a colleague who has been guilty of professional misconduct'.[17]

Such views notwithstanding there are those who argue that *all* professions are a conspiracy against the public. Such people exist in the library and information world. They are a small but very articulate group. They are also wrong. They make the mistake of applying a currently fashionable theory to a profession that is significantly different from many of the other professions against which such an argument could be more justly applied. To be fair their argument is not the selfish self serving one articulated some years ago by Gordon McCrae[18] but is based on a genuine concern for the library's public. However, when it is examined, their case is little more than an example of a self defeating anti-intellectualism.

Those librarians who wish to change the nature of the profession and make it more responsive to the needs of people would do better to gain an effective foothold within it. Though no doubt, in so doing, they will experience a degree of tension between their ideology and 'the system'. It is my view that the public will, in fact, be better served by a profession that recognizes the value and the significance of the skills it possesses. It is not anti-social or necessarily self-seeking to believe in and value the contribution one's profession can make in helping create a better world. As Gorz[19] has written in another context:

> 'intellectuals are needed as intellectuals to furnish the dominated classes with a language and means of expression which will make them conscious of the reality of their subordination and exploitation'.

This is not an elitist view but simply a recognition of the fact that there are groups of people who do have special skills. Skills that can be used to benefit society at large. Librarians and information workers, we could argue, are one such group.

What then has been the reaction to the L.A.'s draft code? In the first place, and most gratifyingly, it has stimulated considerable debate within the whole library and information world. We have already received a large number of letters on the code, there has been comment in the national and professional press and many meetings are being held on the topic. Other professional organizations have also expressed interest in our deliberations.

Of course not all the comments that we have received have been 100 per cent favourable. However, as I have already indicated, the vast majority have been constructive. People have read the document and have written to us endeavouring to clarify or improve particular sections. Only a few have expressed total opposition to the idea of a code and the tone of most of these few letters tends to suggest that their writers would be against almost anything that was issued from Ridgmount Street.

All parts of the code have received some comment and you will not be surprised that most remarks have been aimed at Clause 3. This reads:

> 'The librarian must not knowingly promote material or ideas advocating inequality of opportunity or disharmony between persons of different racial and sexual groups'.

This is simply a recognition that the free flow of information and ideas cannot take place in a vacuum and that it has a purpose. The provision of information is not an end in itself.

Free access to information only has any real meaning if people also have an equal freedom to take decisions on the basis of such information. Thus people who have access to the manifestoes of political parties can, if they so wish, decide to change their political allegiance. However, there is no way that a black person can become white, or a white black, or a woman a man, or a man a woman. Therefore to promote material that advocates inequality or disharmony on the basis of race or sex detracts rather than adds to the democratic process because those sections of the community most concerned do not have the freedom to decide to change—even if they wish to do so. The promulgation of racist ideas be it via publications or demonstrations, such as those of the British Movement or National Front, has more to do with intimidation than information. The Draft Code of Professional Ethics demonstrates that the L.A. Working Party recognizes the difference between the two.

We have, as I said, received many letters on this clause, and on the evidence available at the moment the Peter Simplistic view published in the *Daily Telegraph*[20] is a minority one. While some members have expressed degrees of opposition to the inclusion of the clause, others have written in the following way:

> 'I should like to commend the Association most strongly on its positive stance'.

or

> 'I certainly think clause 3 should stay but it should be expanded'.

Developing this view another member writes:-

> 'I feel it may need to be strengthened to include the term practices .... specifically I refer to classification practices which may reinforce inequality'.

Perhaps the comment that is most representative is this one:

> 'I am sympathetic to the ideas which this clause attempts to express, there is an obvious difficulty in its codification'.

Codification indeed has been a general problem and we are likely to take the advice of a correspondent who suggests 'that the whole document is vetted by a lawyer who has some experience of drawing up legislation'. Useful advice, though I should say that the one clause which was written with the help of a lawyer has proved rather difficult for some of our members to understand.

The formulation of a code of ethics is one thing, the implementation of such a code is another. If a code is adopted by the Library Association it is our intention that an implementation board should be set up following its adoption. That board will have to consider a number of important questions and it will be for them to decide their priorities, but I would be surprised if the following do not feature in their discussions.

(1) Informing members and the public about the code
(2) Monitoring misconduct
(3) Disciplinary procedures
(4) Sanctions

I have already indicated ways in which the public could be made aware of the provisions of the code and it is our present intention that, once approved by Council, a copy of the code would be sent to all members with the information that it would come into force on 1 January of the year following its approval. People seeking or renewing membership thereafter would be subject to its provisions. All new applicants for membership would of course be made aware of the content of the code. Some professional bodies, for example the Royal Institute of British Architects, include professional ethics in their professional education and examine students on their knowledge of the code, thus increasing the awareness of new members of the profession.

It is to be hoped that members of a public made aware of the standards to be expected from a professional librarian will take action when they receive incompetent service, by reporting the incident to the L.A. At the same time, members of the library profession also have a duty to report breaches of the code. Public confidence in a profession will only be maintained if the public feel that the profession is genuinely concerned about effectively maintaining competent standards of practice.

A professional association cannot usurp the functions of the courts and in some instances clients are protected by the law of the land. However, a professional association has a further responsibility to protect the public from bad professional practice. In implementing our code we will have to consider carefully the desirability of, and the procedures involved in, reprimanding, suspending or expelling members. In considering a code of ethics for information scientists, Oppenheim and Kostrewski conclude:

> 'Only one sort of code of ethics is enforceable, i.e. those codes prepared by . . . a controlling body which awards some mark of approval without which it is impossible to practice'.[21]

The I.I.S. is not such a body and the Library Association only one to a limited extent. Expulsion as the final sanction is then, in most cases in the library and information world, more likely to mean temporary disgrace rather than the end of a professional career.

The disciplinary bodies of professional associations vary in their composition and procedures. The Library Association's Disciplinary Committee is presently governed by Byelaws 14 and 30. The full texts of which are available in the L.A. Yearbook.[22] If a code of ethics is adopted there would be a need to consider if the present arrangements are sufficient and also such questions as, the relationship of the committee to L.A. Council, the composition of the committee (should it include lay members?), whether sittings should be in public or private, and powers of punishment. Finally I believe that it is important that the disciplinary procedures be seen to work by members of the public and the profession. Members of the Institute of Chartered Accountants receive full information about the findings and decisions of their disciplinary body. Their example should perhaps be followed by the Library Association.

All this is to look ahead. For the moment we have to decide if as professionals we are willing to take on the responsibility of a code of ethics. Library Association members have to decide if their draft code covers the appropriate areas of professional responsibility. Briefly let me remind you of some of those included in the draft document:

(1) Our professional responsibilities to society, our clients and our employers.
(2) Our professional obligation to facilitate the free flow of information and ideas.
(3) Our professional responsibility to maintain the highest level of competence in professional practice.
(4) Our professional obligation not to behave in any way that prejudices adversely the reputation of the library profession.

Such considerations cannot remain static for all time. We work in a changing society and a professional body has an obligation to review and redefine professional norms in the light of changing social conditions.

In the Library Association we are then working towards a code of professional ethics. The membership is fully involved in this exercise. Outside the profession, interested observers of the library and information scene such as W. Goode,[23] and the M.P. Christopher Price[24] have stressed the need for a code of professional ethics for library and information workers. I hope and trust that as members of the information professions we share their concern.

AUTHOR'S NOTE

Members of the Library Association have been given to the end of April 1981 to respond to the Draft Code of Ethics. In preparing this paper I have considered correspondence received by the 15 January 1981.

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Databanks

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Introduction

THE AIM OF this short paper is to draw attention to the growing importance of online retrieval of non-bibliographic information, and to summarize the salient features of what are commonly referred to as databanks.

A database typology

If we take as our starting point Labin's[1] definition of 'data' as 'a well defined piece of information containing its whole meaning within itself, i.e. intelligible without need of explanations or a context, referring to well-defined subjects and capable of being expressed by compact signs such as a number, a mark in a box, a name, a diagram or a photograph' then the following two-tier typology (after Cuadra[2]) seems an acceptable and convenient, though by no means perfect, way of distinguishing between bibliographic and non-bibliographic databases.

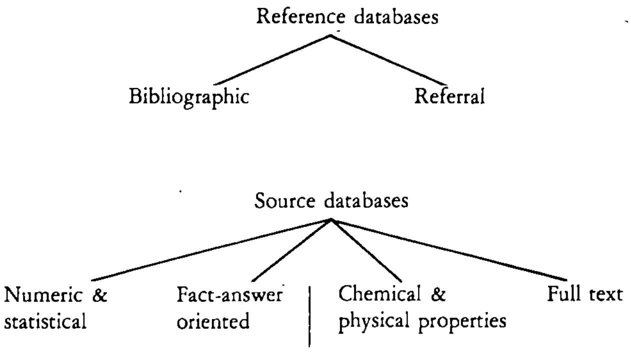

FIG. 1. *Database typology*

The definitive feature of the reference database is that it does not provide stand-alone information; the user has in most instances to proceed to the primary source, though, exceptionally, as in the case of abstract-containing databases or hybrids like PREDICASTS or the NEW YORK TIMES INFORMATION BANK, the database may contain sufficient 'hard' data to satisfy the user's informational needs. (The difference between data documentation and literature documentation is not the

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difference between 'hard' and 'soft' data. Data documentation can be concerned with both hard and soft data e.g. properties of metal or attributes of an individual.)[3] The referral database is slightly different in that it directs the user to names or sources which may be subject to change (in a way that a bibliographic record is not). For instance, a referral database might contain a list of educational establishments and their distinguishing characteristics, or a list of all individuals engaged in funded research in a particular subject area. Source database, to use Cuadra's label, is a portmanteau term covering databank, fact bank, data file, non-bibliographic database, numeric database or information bank. Source databases (databanks as we shall term them from now on) are a growth phenomenon with a significantly greater market potential than their bibliographic equivalents. It has been estimated[4] that comprehensive data coverage for world science would require the setting up of almost 3,000 databanks, though for a variety of reasons this figure should not be treated too seriously. In a sense, there is no ceiling to the number of databanks which could conceivably be created; data are omni-present, ever-growing and capable of being aggregated, compressed or refined, whereas bibliographic records are finite and final. Estimates of the number of commercially available databanks not surprisingly vary, though Aslib is currently compiling an international inventory. The market can be broken up into a number of sectors, Science & Technology (e.g. environmental data, thermodynamic properties, biomedical data, sub-atomic physics), the Social Science & the Humanities (e.g. education, demographic data, public policy), Economic & Finance (e.g. trade figures, business information, macro-economic time series) and Legal (e.g. case law, regulatory information, patents), each sector having its specific requirements.

Distinguishing features of databanks

We have listed below some of the main features which distinguish databanks from bibliographic databases, and we explain why databanks are likely to develop at an accelerating rate.

Restrictiveness

Bibliographic databases provide information about publicly available materials, but non-bibliographic databases offer 'information-as-a-commodity'. The information contained in many databanks enables real-time decisions of practical and economic significance to be made. For this, and other reasons (e.g. data security/confidentiality) a substantial number of databanks are available only to closed user groups. Many, in fact, are created by government agencies for use primarily by government institutions, or government-sanctioned bodies. Most non-bibliographic systems host a limited number of databases, (1–5), with the result that the specific functional needs of the end-user cannot always be met by a single vendor.[5] This user-unhelpful situation contrasts with the bibliographic database situation where a combination of the more powerful vendors can offer a formidable array of files to select from.

Optimal service is impeded not only by the lack of vendor cooperation, though takeovers and mergers in the online market may soon alter this state of affairs,[6] but also by poor marketing (often only to the primary user community), minimal advertising and, importantly, the lack of adequate secondary service coverage for databanks. In the Social Sciences there are signs that the development of a machine readable record format for data files will lead to an increase in public awareness of databank availability, and in turn boost interest in commercially available systems.[7] After all, citation is the cheapest form of publicity, and if researchers and authors can be encouraged to cite data files just as they cite monographs, journal articles and reports, then accessibility and use will grow apace.

Access charges

For most databanks an annual fee, or signing-on charge plus reduced annual subscription, is the norm (in the region of $300–400) and in general there is no linear time-charge relationship such as applies in the case of most bibliographic systems. As far as value–added systems are concerned (i.e. those offering manipulative software) the post-retrieval 'massaging' will cost more than the data extraction (perhaps up to 50 times as much, depending on the sophistication of the analysis). In general, however, there is little evidence to date of standardization or experimentation with tariffs as far as non-bibliographic databases are concerned, which is in marked contrast to the situation with bibliographic databases.

Growth potential

At present the number of commercially available databanks can be reckoned in hundreds rather than thousands, but this situation is destined to change, for two reasons; (a) because 2 out of 3 researchers require data not bibliographic information,[8] and (b) because there exists a vast, untapped generalist market with a wide variety of informational requirements. There seems little doubt that the next 5–10 years will witness a proliferation of databanks in all sorts of fields, serious and not so serious. Think for a moment of PRESTEL as a 'static' popularist databank. The EUSIDIC survey[9] confirmed the growth trend for databanks (and the relative fall-off in the growth rate for bibliographic databases), while the Commission of the European Communities' 1980 'Call for Proposals' resulted in more than three times as many factual or numeric databases being selected as databases of the bibliographic variety.[10] As a measure of market demand or receptivity we might cite the French construction industry databank, ARIANE, which even in 1974 was logging an average of 250 queries per day.[11] Inhibitors to growth may prove to be the cost of data standardization and the labour and time-intensive tasks of data tagging and flagging at the pre-input stage. It is also probably true to say that full market potential will only be realized when user-friendly and easily assimilable command languages are widely available. Worth reading in this context is a recent paper by Stibic,[12] in which he describes the desirability and general properties of user friendly online systems.

Manipulative or Static systems

Data may or may not require statistical manipulation before the user's needs are satisfied. The econometrician, for example, will hardly be satisfied with 'inert' data and will expect his system to offer a suite of programs to permit data compression, analysis, forcasting and report generation. The chemist, on the other hand, may simply want to determine the toxicity of a particular compound, or the appropriate waste disposal treatment, and for this the host system does not need to offer value–added facilities. However, our chemist may at other times wish to establish a profile of a particular compound and this means that the system should be capable of indexing data on a multiplicity of parameters. By way of illustration, the Chemical Information System (CIS) of the US National Institute of Health and the US Environment Protection Agency at present offers more than 120 data fields[13] and the European-based Environmental Chemicals Data and Information Network (ECDIN) is in the process of establishing 100 data fields spanning 10 broad data categories.[14]

The very fact that many databanks offer computational facilities in part explains why databanks are so often used, not by trained intermediaries, but by end-users. Efficient use of the system may well require a knowledge of (sometimes complicated) system protocols, statistical analysis procedures and programming ability, areas in which the librarian and information officer are all too rarely qualified. In addition, the end-user has specific subject or technical skills which enable him to do with the data precisely what he wants at the moment of retrieval, a fact which makes the intervention of the information specialist superfluous.

Search time

In general the mean length of time spent searching databanks online is considerably less than that spent interrogating bibliographic files. The respective figures, it is suggested,[15] are of the order 8–15 and 20–30 minutes.

Database management

Control of bibliographic databases is enormously simplified by the basic universality of the record format. The situation with non-bibliographic databases is quite different. Data are variable in character and can be:[16]

—quantitative, semi-quantitative or qualitative
—presented numerically, alphabetically, alphanumerically, graphically or symbolically
—time-dependent or time-independent
—location-dependent or location-independent
—primary, derived or theoretical
—deterministic or stochastic.

Consequently, record structures are many and variable, and this makes generalizations difficult. Guidelines for evaluation are therefore likely to be difficult to arrive at.

Updating of non-bibliographic databases means rather more than leisurely incremental increase. This is particularly true, for example, in respect of clinical or scientific/industrial information where the discovery of new measuring techniques or materials may necessitate new formatting procedures, which in turn may mean major structural overhaul for the databank. Update frequency in the case of business information and legislative databanks is also vitally important if customer satisfaction and confidence is to be maintained. Timeliness, which for bibliographic databases can be reckoned in terms of months, may have to be calculated in terms of hours or minutes when dealing with fast changing fields.

Database management systems (DBMS), which, to use Rees' definition, 'control a collection of data where there is a well-defined set of relationships between types of records'[17] need to be flexible (to cope with constantly changing data) and user-sympathetic (to encourage optimal levels of use). The quality of database design determines overall system performance and, in the case of commercially available systems, market acceptability. A useful, and informative account of establishing a computerized databank (for clinical trials information) is provided by de Rivaz and North.[18]

Data documentation

One of the appealing aspects of the unit record in a bibliographic database (language differences, notwithstanding) is its structural clarity. Author, title, publisher, etc. are all self-explanatory. This, however, is not true of the constituent elements of a databank, hence the importance of data labelling within the databank. Descriptors, or short codes, which can be numeric, mnemonic, alphanumeric, or expressed in natural language (whatever the preferred form it is vital that an unambiguous menu or index to the coding system is provided), act as markers to identify elements or clusters (and relationships between sets of data) and to make explicit additional values/attributes of the data presented. For example, the U.S. Environmental Protection Agency[19] which lists chemical analyses for inland water can, potentially, generate 2,500 parameter values. In addition, a ten digit record is created based on the time, date and location of each reading so there obviously is a need for data documentation in order that the user can decipher the various codes and characteristics. Similarly, the experimental toxicologist will only derive full benefit from a data set if the characteristics and circumstances of the experiment (time, place, dosage, characteristics of the experimental subjects) are included along with the bare numeric data. Attempts at databank evaluation should where possible take into account the battery of parameters or circumstances which confer meaning or relative significance upon the stored data.

When dealing with international data compilations it is imperative that variations in national standards are clearly indicated, unless already ironed out by the databank producers at the data capture stage, since, in many fields, international standard classification is a dream rather than an actuality. At least the efforts of the Joint ICSU AB/CODATA Working Party (two committees of the International Council of Scientific Unions, the Committee on Data for Science and Technology and the Abstracting Board) to establish a trans-national and trans-sectoral data flagging and tagging grid offer some hope for the future.[20] Of more immediate interest is the availability, for example, on Euronet DIANE of CRONOS-EUROSTAT,[21] the European Community's statistical databank containing more than 600,000 (highly compatible) macro-economic time series for the member nations.

Evaluation

The evaluation of bibliographic databases has tended to focus on the relationship between recall and precision. Subject-based retrieval from online bibliographic files (whether using natural or controlled language) is necessarily imperfect because retrieval effectiveness is affected by the quality of the indexing at the record generation stage. Data, however, are self-sufficient, so indexing, as opposed to data documentation, is not required. In theory there should be a 1:1 relationship between recall and precision. The user knows precisely what he wants, does not have to formulate a search strategy (the cognitive element in bibliographic searching) and, providing he can locate the relevant databank and cope with the mechanics of interrogation there is no reason why the search should not prove to be 100% successful.

The unavoidable limitations of online bibliographic searching created the conditions and impetus for research aimed at refining the retrieval process. Apart from research into this aspect there was also a body of research which concentrated on 'operational' aspects (e.g. search strategies, user-system interaction)—what Lancaster termed 'non data base factors'.[22] Clearly, research of this latter kind can be carried out in respect of databanks, but there is no central feature of databank use which corresponds to the recall/precision relationship, and which could form the basis of a general exploration and evaluation programme.

Databanks are functionally and operationally heterogeneous, unlike their bibliographic counterparts. The centrality of the recall/precision debate was due to the importance of establishing the efficiency and cost-effectiveness of online searching as against manual searching. With non-bibliographic databases there is no equivalent area which calls out for exploration. Furthermore, the user populations of databanks are, and are likely to continue to be, composed largely of end-users, not librarians, information personnel or documentalists. Given the variety of databanks and databank user communities it is difficult to be convinced that there is a single aspect of databank systems which can, or will, become a focus of general evaluation, though we at Aslib would be pleased to hear from anyone who feels there are particular problems or areas in need of systematic investigation.

Each databank demands individual scrutiny, though that is not to say that certain shared bases for comparison do not exist. The pursuit of 'noiseless' retrieval in bibliographic systems has appeal at both the practical and the abstract level, but no such researcher challenge exists in the realm of the databank. Nonetheless, we feel that evaluation could usefully be considered in the following five areas:

(i) CONTENT	—coverage (depth, scope, time) —parameter count —data documentation —formatting (layout, compression) —currency —accuracy (i.e. degree of exactitude)
(ii) ACCESSIBILITY/ USABILITY	—availability of user-selectable search parameters —conversationality of the command language —usability of interfacing software
(iii) COST	—subscription/down payments —access charges —computational charges
(iv) META FEATURES	—statistical/forcasting software —graphical display capability —interfacing/linking features —data extraction and merging features
(v) RELIABILITY	—data integrity/validation

Summary

The literature dealing with databanks and their development offers little in the way of guidance as to how evaluative studies might proceed. Yet, evaluation studies are an important part of the development cycle of a new field, not least since they insure that there is some correspondance and compatibility between the intentions of the system builders and the needs of those who interact with the system. Houghton and Wisdom's survey,[23] timely though it was, of the users of business and economic databanks offers little in the way of prescriptive or diagnostic findings. However, they do make the point, and an important point it is too, that librarians and information workers should wake up to the implications of the databank phenomenon or surrender the traditional reference function to service suppliers and information brokers. Support for this view comes from Robbin who laments the fact that 'few librarians have integrated the numerical data base into their collections, although it can logically be considered another information resource.'[24] We mentioned earlier that most databank users were specialists/professionals, but that does not mean that the information worker has no part to play. It is up to the profession to decide that it should become involved in the databank revolution and then to establish areas in which its particular expertise and experience can most profitably be developed. In this sense, Houghton and Wisdom's[25] recommendation that online teaching packages incorporating non-bibliographic databases should be available in schools of librarianship and information science is both apposite and far-sighted.

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Self-paced exercises for library orientation

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This paper points out the need for economical and effective methods for library orientation. Objectives and factors affecting the learning process are briefly stated. Various teaching methods are examined in relation to these factors. The use of one method—the self-paced tour—is described in some detail, together with evaluation of an experimental use of this method for 205 mechanical engineering undergraduates. It is concluded that the self-paced tour with exercises is an excellent method for library orientation. The programme has subsequently been used for a wide variety of new users and proved time-saving for library staff and popular with students.

Introduction

THERE IS AMPLE evidence that new student users often find the large university or college library a confusing and bewildering place.[1,2,3]

There is a very real need to provide some form of *orientation* about the library, *what* is available, *when* the library is open, *where* the specific items are to be found and *how* to obtain/borrow the required material. This orientation has often to be designed for large numbers of students, in spite of inadequate library resources. The orientation programme is particularly important, in that it is, for many students, their first introduction to the university library and their future attitude to using the information resources available there will be strongly influenced by first impressions. It is difficult to provide good library orientation at a reasonable cost. This paper will briefly describe the objectives for orientation, and examine various methods for achieving these. One method—the self-paced orientation tour—will be described in some detail, together with its experimental application and evaluation.

Objectives for library orientation

The present user education programme at Chalmers University Library, Gothenburg, has been developed since 1975, and is now attended by some 3,000 students per year. The courses range from orientation for new users to instruction in computerized information retrieval. The objectives for library orientation are affective (concerned with attitudes), cognitive (concerned with understanding) and psychomotor. The specific objectives for the library orientation programme have been formulated as follows:

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After library orientation, the student should:

1. Be aware of the existence of the university library, what it contains, and when it is open.
2. Have the ability to locate books, handbooks, encyclopedias, dictionaries, periodicals (on open shelves), and the photocopying areas.
3. Be able to distinguish between the use of the author catalogue and the subject catalogue.
4. Have the ability to use the library and be able to fill in a requisition form for the most common types of loan (books, journals, and parts of a series).
5. Want to use, and actually be able to use, the university library with confidence, in connection with studies.

Teaching methods for library orientation

The learning process is affected by a number of factors:

Motivation (student motivation)
Activity (active work)
Understanding (relation of new information to an existing frame of reference)
Feedback (information to the student as to rate of progress)
Sensory input (auditory and/or visual input)
Rate of flow (possibility for the learner to control the rate of flow of information)
Interaction (student-teacher, student-student)

Methods where a great many of these factors are present provide the most favourable situations for learning. The traditional methods for library orientation the 'guided tour' and the 'lecture' were examined, against this background and found to be lacking in several of the factors. Therefore the orientation programme at Chalmers Library was based on the use of small group methods and self-instructional material.

A printed handout for new students and a 16-page Guide to the Use of Chalmers Library were produced. This guide described the services and resource available, the hours of opening, the location of the material, and how to obtain the literature required. This guide was written with the user in mind. Technical jargon was avoided throughout. It was produced in a size that would fit into a pocket or handbag, and there were a number of illustrations produced by two architects who had just completed their studies at the university.

A self-guiding colour-shape coding system was designed for the location of material available for direct access to the library. Schemes of colour-coding/shape-coding have been developed at a number of libraries. One place where such a scheme has been developed in detail, was at Hatfield Polytechnic Library in England.[4,5] The colour scheme at Chalmers utilized the different colours used by the six Schools of Engineering. With this scheme, material pertaining to the School of Electrical Engineering is coded with yellow symbols—the colour used by that School of Engineering. Differently shaped symbols have also been chosen to represent different types of material to be found in the library (see Figure 1).

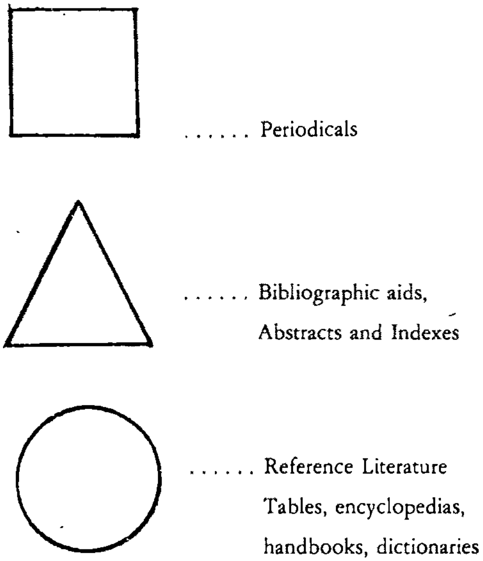

FIG. 1. *Symbols representing the different types of material to be found in the library*

In addition to the location signs, other signs were made and put up, for example a sign showing how to complete a loan-request form for the three most common types of material to be borrowed—books, periodicals, and series. This sign was hung over the author catalogues.

Small-group (for up to 15 persons) teaching sessions were regularly provided for first year students in architecture, chemistry and mechanical engineering.

In spite of the self-instructional signs, a considerable amount of time still had to be spent on demonstrating the lay-out and arrangement of material in the library. This was mainly due to the relatively complicated arrangement of material as Chalmers Library had been originally designed as a closed-access library, and converted for open-access in 1978.[6] These demonstrations of the library were time-consuming (and for the teachers, at least, repetitive and rather boring). So efforts were made to find other teaching methods.

The self-paced tour

In the U.S.A. considerable use has been made of programmed instruction, including so-called self-paced tours. The most widely used material is based on Miriam Dudley's Workbooks—*Workbook in Library Skills*,[7] and *Library Instruction Workbook*.[8] The former has been purchased by many libraries throughout the world and adapted for their own use. One example of this is the workbook produced by the University of Wisconsin-Parkside for use in their Collegiate Skills Program[9]—*Basic Library Skills*[10]—a self-paced introduction to the use of the Library/Learning Center, University of Wisconsin-Parkside.

It was decided to try out a self-guided orientation tour, with appropriate exercises at Chalmers. An 8-page orientation handout was produced, with plans as to lay-out of the library (see figure 2), information on the sign/symbol system for location of material, use of the author and subject catalogues and list of periodicals, and rules for borrowing and photocopying material.

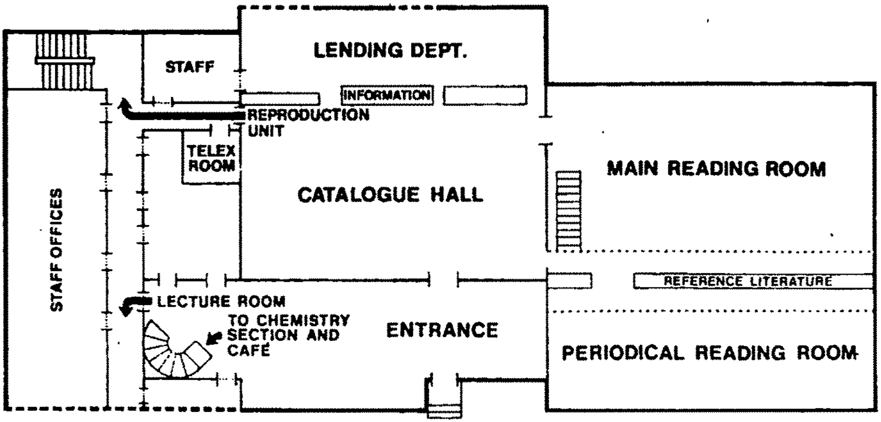

FIG. 2. *Layout of Chalmers Library; ground floor*

Students were given the orientation guide, together with individual exercise sheets, (the exercises were of the same type, but structured so that no two students in a group had identical questions). The students started by reading their material. This was followed by five minutes for questions and introduction. The students then set off on their tour of the library, following the instructions on their exercise sheets. They had, for example, not only to identify a book in the catalogue, but even to locate it, and note its attached number, in the appropriate part of the library. During the tour, which took about one hour, the students completed their exercise sheets, which were subsequently checked by two assistant librarians.

Evaluation of the self-guided tour

This self-paced tour was given to some 205 first-year mechanical engineering undergraduates. Evaluation was carried out in two ways:

(a) The exercise sheets were checked. This was an example of *formative evaluation* directed towards the *product* of the orientation tour. Results showed that of 2665 questions, only 147 mistakes were made. Students had successfully located, by means of the author and subject catalogues, lay-out plans and coding-systems, different types of literature. They had used the computer-produced list of periodicals and located journals in both reading-room and open-stacks. A loan-requisition form had been correctly filled in and questions answered about the available library services. The cognitive objectives outlined above (1–4) had been achieved.

(b) All students taking part in the experimental study of the self-paced tour were asked to complete a short questionnaire on their attitudes to the orientation tour. This was an example of *formative evaluation* directed towards the educational *process* involved. Results are summarized below.

With regard to the students estimation of their *overall gain* from the orientation programme, results were as follows:

TABLE 1. *Overall gain*

Nothing	0%
Little	2%
Satisfactory	46%
Good	41%
Very good	11%

90 per cent of the students judged the *length of the orientation* handout as 'just right' whereas 2 per cent thought it was too long and 8 per cent too short.

Students were asked if they enjoyed the exercises. Their responses were as follows:

TABLE 2. *Enjoyment of self-paced tour*

Not at all	3%
Fairly	39%
Much	45%
Very much	7%

34 per cent of the students thought that this was a *very good method*, and 61 per cent a *good method*, for teaching about the use of library.

The exercises were judged as of about the right level of difficulty by 82 per cent of the students, whilst 18 per cent thought they were easy and 1 per cent difficult. Comments made by the students were overwhelmingly positive.

> 'This is the right method to learn how to find things in a library'
> 'I think it is very good that we can go round and look for things ourselves, this is better than listening to someone who shows you round'
> 'The exercises were good, you learn most by working yourself'

Several of the students wished to have even more exercises, and to have them as early as possible in their course of studies. (They were given 6 weeks after the start of term).

These results showed that the affective objective (5) had been achieved by the use of the self-paced tour-method.

Conclusion

It can be concluded that the self-paced tour with exercises is an excellent method for library orientation. It appears popular amongst the students, and the results of learning are good. At the same time, this form of teaching is economical on library staff time, especially when compared with the alternative the 'guided-tour'.

After a few minor modifications, as a result of the evaluation, the self-paced orientation programme has been used successfully for undergraduates in civil engineering and electrical engineering, students of architecture, trainee laboratory assistants, health inspectors, teachers etc. It has proved both time-saving, for the library staff, and popular with the students.

Self-paced orientation is a useful method for introducing students to the library. This should be followed at a later time by courses in information retrieval—preferably in connection with a project or a seminar for which the students require information.

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The selection of periodicals for binding

P. G. Peacock

Stirling University Library

THE BOOKS, PERIODICALS and binding component of the *Index of university costs* is based on the assumption that the ratio of expenditure on binding to combined expenditure on monographs and periodicals in British university libraries is 1:8. Practice in individual libraries varies widely about this mean. It is possible to find even among libraries serving similar academic populations ratios varying from 1:6 to 1:20. There may of course be sound reasons for particular binding policies that depart markedly from the norm. The purpose of this paper is not to advocate uniformity of policy but to propose a set of criteria for the selection of periodicals for binding that may assist librarians to apply their professional judgment systematically, whatever the level of funds at their disposal.[1,2]

The need for clear criteria has become more pressing. When funds are low it is an attractive expedient to leave material unbound in order to preserve as much as possible of the library grant for the purchase of new titles. It is not suggested that this is a bad policy; only that, if it is to be pursued, it should be pursued methodically and with a proper understanding of its consequences.

A survey conducted at Stirling University Library in November 1979, following some five years of enforced economy in the binding of periodicals, showed that 780 linear metres of shelving, equivalent to 20,000 notional periodical volumes, were occupied by unbound periodical parts. Even assuming that 20 per cent of this total would never be bound under any criteria, the cost of a retrospective binding exercise would still have been £96,000 at 1979 prices exclusive of administrative costs.

This case study illustrates the major consequence of successive annual economies in binding: that if continued for more than a year or two they produce a backlog that is completely intractable. The argument that the effects of binding economies can be remedied at some future date when money is available should be used with caution, and not simply because money for this purpose is unlikely to be available. The real danger of waiting for something to turn up is that it hinders the search for a binding policy better suited to the restricted resources with which we now have to operate. Indeed, a very large gap between need and resources may be a positive advantage if it encourages us to abandon a position that can no longer be held and retreat to a position that can be held indefinitely.

Before considering what an appropriate policy for binding periodicals might be it will be helpful to rehearse the main arguments for and against binding. Arguments in favour of binding periodicals are:

(a) It is easier to keep bound volumes in order on the shelves.
(b) Readers find it easier to use bound volumes than unbound parts.
(c) Binding protects volumes from mechanical damage.
(d) It is easier to preserve and use volume indexes.
(e) Binding keeps pages more tightly together and helps to prevent the ingress of atmospheric pollutants.

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Arguments against binding periodicals are:

(a) It saves money.
(b) Readers can use simultaneously the separate parts of a volume.
(c) Volumes are not absent from the shelves while being bound.
(d) It is easier to repair damage.
(e) It is easier to photocopy unbound parts.

Arguments about shelf order and convenience to readers are connected. The preference of most readers is to handle a bound volume. Many however are satisfied with a no-binding policy provided that arrangements for shelving unbound parts allow them to find what they want with equal ease. Bound volumes and unbound parts seem equally vulnerable to vandalism and theft. It is easier however to repair damage done to an unbound part than to repair damage done to a bound volume, and cheaper to replace a stolen part than a stolen volume. Most of the unbound periodical titles surveyed at Stirling in 1979 had survived unbound remarkably well. It was possible to find very many examples of unbound parts in mint condition even after ten or more years' exposure on public shelves. The conclusion to be drawn is that there is no overriding, generally applicable argument for binding periodicals. There may be good reasons for binding particular periodicals, in which case the need is for a procedure for identifying them.

Nicolas Barker, Head of Conservation at the British Library, has proposed[3] a decision table for use in assessing conservation priorities. It contains a set of questions to be asked in respect of each title being assessed, and so allows each title to be assessed according to the same criteria. A similar table, modified for use with a periodical collection is suggested below.

TABLE 1. *A decision table for selecting periodicals for binding*

	criteria			
	1	2	3	4
score	*physical condition*	*number of parts/year*	*frequency of use*	*value*
1	good	≤4	low	low
2	average	5–12	average	average
3	poor	≥13	high	high

In most cases the physical condition of a title can be quickly assessed (column 1). If a title has survived successfully unbound, the chances are that it will continue to survive unbound. Inspection may show however that there is difficulty in maintaining the correct sequence of volumes and parts on the shelf. This difficulty increases with frequency of publication. Each title should therefore be given a score that reflects the actual or potential inconvenience of leaving it unbound (column 2). Heavy use increases the risk of mechanical damage to unbound parts and must also be taken into account (column 3). The value of a title may be assessed in terms of purchase price, rarity, academic standing or local interest (column 4). Generally a title scoring several 'threes' will be bound. A title scoring several 'ones' will be left unbound. In the survey referred to above it was estimated that about one-sixth of the 3,000 volumes received annually in Stirling University Library scored two or more 'threes'.

Exceptions to the general rule are newspapers and other voluminous titles on poor quality paper for which the best policy is neither to bind nor to preserve unbound, but to replace by microforms.[4]

NOTES AND REFERENCES

Articles describing selective binding policies for periodicals are relatively rare. References 1 and 2 are examples.

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4 The case for a more widespread use of microform as a replacement for hard-copy periodical titles is outside the scope of this paper. A discussion of the main points at issue is contained in Annex F of UNIVERSITY GRANTS COMMITTEE. *Capital provision for university libraries: report of a working party.* London: H.M.S.O., 1976.

The availability of Marc records for cataloguing

R. J. Davis

Stirling University Library

This paper, written to follow a recent article in this journal on the processing of current acquisitions, reports that the amount of original cataloguing having to be done at Stirling University Library has been found in practice to be significantly less than was forecast by a survey made before automation was introduced. The use of American catalogue records has also been higher than predicted. The recent introduction of shared cataloguing among members of Scolcap has not yet produced any change in the amount of original cataloguing, but has made the library much less dependent on centrally produced records made available through the British Library.

DEREK LAW'S PAPER[1] raises pertinent questions about the availability in the United Kingdom of machine-readable records for processing a library's current acquisitions. At Stirling University Library we have carefully monitored the performance of the cataloguing service (Locas) which the British Library has been supplying us since 1978 and we have compared the results with those forecast by the Scolcap pilot survey in which we took part in 1974. With British Library's development of the Union-Locas service, we now have a union catalogue, 'Scolcat', which is available to us to check, in addition to the files available through the British Library. With this facility, we have since October 1980 been able at last to participate in a shared cataloguing group and we are therefore hoping to reduce still further the amount of original 'Emma' (extra Marc) cataloguing we have to undertake. Indeed, as the figures below will illustrate, we have consistently had to do less cataloguing than the figures from the 1974 survey led us to expect.

Table 1 gives overall figures for the proportion of machine-readable records (Marc) we have obtained from U.K. files, Library of Congress and, latterly, Scolcap files.

TABLE 1. *Machine-readable records obtained*

	UK	*LC*	*Scolcat*	*Total Marc*
Projected by 1974 survey	47%	15%	—	62%
With Locas 1978–80	44%	24%	—	68%
With Union-Locas 1980–81 (4 months)	25%	18%	25%	68%

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The 1974 survey figure is in reality difficult to compare with our actual experience of the last few years. The 1974 figure of 62 per cent is the potential maximum we thought at the time was possible, based on the evidence of control numbers printed in the books, or for new British titles, entries in the *British National Bibliography*. It is therefore all the more surprising that in practice, and with an average failure rate of 20 per cent on the British Library's Selective Record Service, we have recorded a figure consistently so much higher.

The principal reasons for practice exceeding prediction are simple, and derive from the differing circumstances prevailing in 1978 from those of 1974 and from our experience in using the resources available to us. The delay between the survey and our beginning to subscribe to Locas allowed the agencies responsible for preparing machine-readable records to add considerably more records to their files, thus increasing their scope and usefulness. The number of years' publications covered by these files had increased, an important factor for a library serving an expanding university building up its basic collections as well as purchasing selectively from the current year's publications. By now our cataloguers have acquired considerable experience in judging in which cases the Marc records are likely to be available and when it is best to catalogue books themselves. We are making better use of the machine-readable records that are available and this in itself contributes to the improvement in general performance. It is perhaps worth mentioning that using the Library of Congress 'Marcfiches' service has undoubtedly led to an increased awareness of the scope of the American files and so to an increase in their use. This must explain in part the consistently high proportion of American records we use in our catalogue.

We have as already mentioned a 20 per cent failure rate with the British Library's Selective Record Service. This figure is a mean average over three years and reflects our use of both British and American current and retrospective files. The availability of the microfiche list of records on the U.K. retrospective files means our failure rate there is low. Apart from these, the distribution of 'misses' or failures between British and American files is of the order of 3:2. Some of the American ones may be explained by the delay in the British Library's obtaining tapes from Washington. Some of the British ones can be explained by publishers' failures to co-operate with the British Library's Cataloguing in Publication Programme or by the British Library's failure themselves to catalogue books promptly. We may soon be able to reduce the time spent on cataloguing new books not yet coped with by the British Library by taking advantage of the 'waiting for Marc' facility which allows libraries to enter only the minimum amount of detail and to let that brief record stand until overwritten by the British Library's exchange tape with the full record.

The main conclusion from the comparison of actual practice with the 1974 survey is nevertheless that the results have been much better than we anticipated. Edinburgh University will find, when they become full members of Scolcap next year, that the picture is better than their present calculations may indicate.

Does shared cataloguing help?

Table 2 gives figures for the performance with Union-Locas in the months since the service became fully operational.

TABLE 2

	UK	*LC*	*Scolcat*	*Total Marc*
1980 November	27%	25%	8%	60%
December	23%	23%	19%	65%
1981 January	30%	19%	32%	81%
February	19%	8%	40%	67%
Average so far	25%	18%	25%	68%

It is perhaps a little early to read too much significance into the results of such a short experience of shared cataloguing, especially as the introduction of this facility coincided with the introduction in Scolcap libraries of the revised cataloguing rules. Two trends may be establishing themselves. Firstly the amount of machine-readable data available has not yet increased and so we are still having 32 per cent to catalogue fully, from scratch. Secondly, the use of Scolcat appears to be rising at the expense of the British Library's Selective Record Service. In Table 3, I list the proportion of Scolcat records used which have Scolcap control numbers rather than BNB, UK or LC numbers, and which represent items catalogued by the libraries themselves.

TABLE 3

November	14%
December	15%
January	9%
February	9%

This is not the total picture. It is not possible, merely checking the microfiche union catalogue, to know which entries are ones libraries have taken from other sources and which they have compiled themselves, as often a cataloguer will enter a record under an ISBN, if available, to lessen the likelihood of duplication of records in the files. Therefore the percentages in Table 3 represent a minimum of other Scolcap libraries' cataloguing that we have been able to use so far.

It is not surprising to discover that other libraries are buying the same standard material from the same range of commercial publishers as ourselves, and it is interesting to see where our general interests overlap. It is nevertheless disappointing that the amount of full cataloguing has not yet shown signs of diminishing. The proportion may go down as the year goes by, for there is evidence, as seen in Table 3, that at least 10% is derived from other Scolcap member libraries' own cataloguing. I suspect that it is only when we also have access to the files of other co-operative groups in the United Kingdom or elsewhere that the proportion will increase substantially.

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Letter to the editor

GINs, TWINs AND THIRD WORLD INFORMATION NEEDS

Ziauddin Sardar's rejection of the Global Information Network (GIN) concept in favour of a Third World Information Network (TWIN)[1] has much to commend it. Certainly, a priority in information for development must be for developing countries themselves to bring their own 'grey' literature (such as unpublished and semi-published reports and surveys), under bibliographic control. This material contains vital information for national development.

However, surely the International Nuclear Information System (INIS) and the International Information System for the Agricultural Sciences and Technology (AGRIS) must be recognized as the prototype systems for any further development of GINs, or TWINs for that matter. They have proved that co-operative, decentralized information systems, within the conceptual and organizational framework of UNISIST, can be successful, and that *all* participating countries can have an equal share in policy formation and systems management. AGRIS has at present over 90 national input centres around the world, the 60 per cent in the developing countries providing 25 per cent of the total input. The development of AGRIS subsystems in Latin America and South East Asia provide good examples of regional, agricultural TWINs with all the benefits Sardar lists.

Naturally, there are problems. Even great problems, but AGRIS has done more to stimulate the development of information centres and expertise, and to create a general awareness and recognition of the value of information in developing countries than has yet been achieved by any other UN, North-South or Third World system.

Peter Thorpe
Dept. of Agricultural Research,
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Amsterdam

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NEW TRENDS IN DOCUMENTATION AND INFORMATION

Edited by PETER J. TAYLOR, Aslib

Proceedings of the 39th FID Congress,
University of Edinburgh;
25–28 September 1978

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The 39th Congress of FID was widely regarded as being held at a critical time in the Federation's history, and the delegates present at Edinburgh University in September 1978 were asked to give special attention to FID's future role and objectives. The meeting of the General Assembly in Mexico in 1976 had agreed that the 39th Congress should provide an opportunity to take stock of where the Federation stood, and to consider in which directions it should go to serve its professional membership and fulfil its role internationally. This arose from a consensus that the growth of activity of the professional bodies worldwide had only increased the need for a body like FID to focus on the requirements of those engaged professionally in documentation and information.

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MACHINE AIDS FOR TRANSLATORS

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Introduction: Help from the computer

Veronica Lawson

Translator and consultant, London

'THERE YOU HAVE it: the difference between the human translator and the machine', said Barbara Snell, chairman of 'Machine Aids for Translators', when she saw the cover for these proceedings. Fully automatic translation was no longer 'pie in the sky', she had said when introducing the conference: 'machine translation may not be pie on the table, but it is perhaps pie in the oven.' If intelligent youngsters were not to be put off translating as a career, therefore, translators must equip themselves with machine aids in order to fulfil their potential and make the most of one attribute which the machine would never acquire: the ability to think. The translations of the conference title, so non-literal and thoughtful, typify the human translator's approach. We render not words, but ideas.

'Machine Aids for Translators' took place in the Kensington Close Hotel, London, in November 1980, almost exactly two years after the first major meeting on 'Translating and the Computer'.[1] Whereas the 1978 event had introduced both of the twin subjects of machine translation and computer aids, the 1980 one concentrated on the latter. 'The added attraction of an exhibition,' suggested our chairman, 'is significant. It shows that we are keeping our feet firmly on the ground, concentrating on what translators can do to increase their scope with the aid of modern technology.'

Tony Stiegler (Application Programming Techniques) looked at office costs and the likely effects of present and future machine aids. Robert Clark (freelance translator) reported his experience of a word processor ('terrific, but . . .'), and called for a users' group to press for standard media formats and commands. Pauline Duckitt (Pharmaceutical Society) gave a deft and thought-provoking explanation of how translators could use online information retrieval to tap distant sources of information—not only Eurodicautom, the EEC term bank, but all over the world. John McNaught (Centre for Computational Linguistics, UMIST) talked of the proposed British term bank, multilingual, multidisciplinary and sorely needed. Peter Arthern (Council of the European Communities) discussed machine aids for the large European institutions, particularly his own, in which 45 per cent of the translation output is existing text which has been amended. Finally, Professor Juan Sager (UMIST) gave an illuminating summary of the changes in the translation market.

The exhibition attracted much attention, remaining open for some hours after the conference. The European Community institutions demonstrated both their much valued glossary and the Echo service, which provides online access to Eurodicautom. Weidner Communications (Utah) and Hamilton Rentals showed the Weidner machine-aided translation system. Data Recall and Rank Xerox demonstrated their word processors, and Technical Translation International combined with CPT (UK) to present a 10-language integrated word-processing system, which includes input by optical scanning and output on telex or phototypesetting tape.

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The great interest aroused by machines was indicated by the fact that 200 people attended the conference, 12 per cent more than in 1978, despite an unfavourable economic climate. Because of the emphasis on human needs, the group with which Aslib Technical Translation Group cooperated on this occasion was the Translators' Guild of the Institute of Linguists (the other British body for technical translators), and not the Aslib Informatics Group as in 1978. The proportion of the participants who were translators remained at 60 per cent, but the ostensible absence of machine translation from the programme seems to have caused a shift away from the universities and information science towards administrators, data processing people and, significantly, translation users. Although the strong pound had made London expensive, one third of the participants came from abroad, the same proportion as in 1978; the number of countries represented was still 12, and included the US and Africa.

'Computers are putting translation on the map,' one large translation company said. 'We could never get in to see senior management before, but when we began using computer aids, they were suddenly happy to talk to us.' Nor is it only large translation services which can benefit from the increased efficiency and prestige. A word processor, for example, may still seem too dear to many translators, at £7,000 or £9,000. However, there is a cheaper alternative. Buy the parts separately—microcomputer, screen, wordprocessing program and printer—and you can have a useful wordprocessing system for as little as £1,400 or, with a better printer, £2,100. (Now, in fact, the cheapest home computers at about £100 may offer simple wordprocessing, but they do not have the versatility and robustness which translators need.) For a small additional outlay, moreover, a word processor can usually be used as a terminal to retrieve information from data banks elsewhere. The disadvantages of machine aids, such as the incompatibility of floppy discs from different word processors, should not be overlooked, but the general picture is very promising.

As the machine streamlines and diversifies the translator's job, our view of that job will change considerably. 'It is only when you have worked day after day with [it] for some time that your conventional concepts break down and you begin—little by little—to glimpse the possibilities,' Robert Clark said of his word processor. This applies also to other machine aids and even, in my experience, to machine translation. Fortunately, unlike some groups, translators need not fear replacement by machines, for the spread of industrialization and the 'information explosion' have produced a huge and largely unfilled need for translations. The computer will, however, allow the translation user to be offered 'a wider range of products', as Professor Sager said, from the traditional full human translation down (far down!) to raw machine translation for information scanning. (This theme of choice was also explored the next day in a Guild seminar on 'Translation Specifications'.)

Choice, of course, requires the exercise of judgment. The translator must become more versatile, the user probably more aware of the translator and his skills. Above all, choice will emphasize the difference between the human and the machine. 'Tout ce qui est mécanique peut être fait d'une façon satisfaisante par un mécanisme, tout ce qui demande les connaissances, l'expertise, l'intelligence, de l'être humain—c'est-à-dire la partie du boulot [job] qui est vraiment intéressante—tout ça reste du domaine du traducteur.'[2]

Machine translation, although excluded from the conference programme, kept creeping in. It was even represented in the exhibition, for the Weidner, though marketed firmly and sensibly as a machine aid for translators, is in fact a machine translation system. MT also made an important appearance in Mr Arthern's paper. Systran, bought by the European Commission in 1976, may not yet be good enough for their translators; but the Cambridge Language Research Unit has succeeded in 'machine-translating' the program into English, and once translators can understand it they will see ways to improve it. Machine translation seems indeed to demand the insight of the professional translator, as well as linguists and computer scientists.

The next in this series of conferences is to be on machine translation: the *practical experience of machine translation.* The speakers, notably translator/posteditors, will be people who work with MT systems in regular practical use. Until we see whether the machine is a help or a hindrance, or both, or even neither, the debate will continue.

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Machine aids for translators: a review

A. D. Stiegler

Office Automation Consultant, London

Paper presented at the Aslib Technical Translation Group conference and exhibition, London, 20 November 1980

Since translating is an office activity which, like other office activities, consists primarily of processing text, it is instructive to examine the reasons for automating text production. Most of these reasons will be equally applicable to the production of translated texts.

We shall then investigate the current developments in machines and micro-chip technology which are applicable to translation. These will include voice recognition and response and optical character recognition equipment amongst others.

YOU MIGHT ASK yourselves why machine aids at all? So I'd like to talk a little about the economic justification for automating office activity. Very briefly if we look at investment in capital equipment in the United States in 1975 we find that the investment in the office was less than a tenth of what it is in the other areas of agriculture and manufacture. If we then look at how that money is spent in the office we find that 86 per cent is labour costs. The office is a very labour-intensive area. (See Fig. 1). This is evident from the figure of $2,000 of capital expenditure per annum. (See Fig. 2). If we then look at the costs of one of the primary activities in the office, typing an A4 page, if we look at how that cost has changed over the past 25 or 30 years, we see that it's increasing and in fact today it is around $7.00 per page, simply because it is a labour intensive activity. So what about capital expenditure? What's happening to technology, what's happening to machines? Well, everybody knows about chips by now, I suppose, having seen the programmes on the BBC and on ITV and probably on all the other channels in the world and we know that technology costs are dropping and they are dropping at a very considerable rate. For example the costs of logic, the actual processing of the data that you've got, the cost of that logic is going to drop by 1985 by 95 per cent according to these figures. According to more recent figures that I have in fact it has dropped by 95 per cent today and it will probably drop by quite a bit more by 1985.

So that is why it will probably be cheaper to do it with machinery than it will be to do it with labour. Having said that, what are we doing with machinery? What we're doing with it is typing and you might well ask yourself what's wrong with a typewriter? The primary thing that's wrong with a typewriter is that it has no memory. It cannot remember what you keyed into it yesterday and the entire dialogue that you have with

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a typewriter is conducted on a piece of paper. It's hard copy. And as a consequence it's very hard to manipulate it. So if you've made a mistake or if you've decided to put a paragraph in a different place or if you've decided to change something in some way, you can't do it very easily with a typewriter. So what do you want to do? You want to use a word processor. Well, what's a word processor? A word processor is a device which assists in text preparation and production and it has reproduction, storage and retrieval as well as transmission potential, transmission potential being the ability to send, like a Telex, a document from one place to another along a telephone line. So that's what a modern word processor is and what makes it so much better than a typewriter? Typically it has memory to record the typed information and here's an example of difficulty of hard copy dialogue and one of them is: I'll never be able to change that word 'type' to 'typed' because that's what it should be, until I make up this slide again because I haven't preserved that information electronically. So it has memory to record typed information and typically it has a visual display unit with the operator able to see the corrections being made as they are being made.

The whole activity of word processing can be summed up in five headings: it's the sum of all the activities involved in the origination, in the preparation in the production and reproduction, in the storage and retrieval and in the transmission of texts. That's what word processing is all about.

So now we know what word processing is, we know a little bit about why we want to buy a word processor or might think about buying a word processor. And so what should we do when we buy one? The first thing that you should do is examine why you want to buy it and you have to define the contribution that you require of this device. You have to ask yourself: what is it that this is going to give me that I haven't already got? And if what it's going to give you is not sufficient to justify the cost—and the cost of these things is fairly high, make no mistake about it. It's not like buying an electric typewriter. An electric typewriter costs you about £2,000 and one of these things will cost you the minimum of about £8,000. So you have to define what the contribution is so that you can tell which piece of equipment to buy. The next thing you have to do is to determine how to achieve that contribution, how to obtain the benefit that you have told yourself you are going to get by introducing word processing.

The first thing you have to do is analyse existing work loads. For example, in the translation field if your existing work load entails a large amount of report writing and therefore editing, that will make up the bulk of your work, you may find that in analysing that work there are places where you can use standard text or quasi standard text, so you have to analyse that to find out exactly what it is that you are actually doing. You have to draw a plan for revised work loads because what's going to happen is that now, in a typical office—and this is incidentally a general discussion that is not necessarily specific to translation. This is true of any office activity. In any office, what's going to happen with the introduction of word processing equipment is that the work flows will change. The places that work goes to and from will change. And the final thing that you have to do is to get a commitment of management if you don't happen to be your own boss. You also have to get the commitment of the people who are going to use it.

Some of the ways in which you are going to be able to avoid mistakes is to look at the word processor as a system and not as a collection of individual features. The reason I say this is because when you go to a word processing exhibition, and there is one at Wembley, for example, every year and there's the Hanover fair in Germany and SICOB in Paris which all exhibit word processing equipment, you will be blinded by science. You'll walk in and you'll see these fantastic machines and people will say 'My machine has a feature to ring a bell every time you want to do something or whatever and its got bells and whistles on it which no other machine has'. You can't look at a word processor that way. You have to look at it as a system within itself and also as part of the larger system which is your office. So it has to be viewed in its context and if you feel there is a feature you need, and for translators for example, one such feature might be the ability to display diacritical marks on the screen, have it demonstrated. Don't believe anything that a manufacturer tells you! The next thing you should do, is to test the equipment with samples of your own work so that you can see it actually performing the kinds of jobs which you wish to perform.

A typical mistake which people make in selecting equipment is that equipment is rejected because it doesn't have a particular feature. This could be a mistake because there are certain bits and bobs of equipment around which you think may not have a particular feature which you need but if you find one that does have that feature, it may not have a lot of other features that you really need and therefore you might select it along with this particular feature and make a mistake.

Now one of the problems with word processing and the area of office automation lies in the fact that in most instances, any word processor is better than no word processor because it is going to give you the things that you are looking for. It's going to give you easier editing, it's going to give you, if you're not your own typist, faster turn around from the typist, it's going to give you higher quality output from the point of view of the number of mistakes in it and so on. It's going to give you less requirement for proof reading and all the great benefits one achieves from word processing are going to be achieved whatever word processor you use. But for *your* application, some word processors are better than others and your application over here may not be the same as that person's application over there. He may have a totally different problem from yours. The other problem is that when you do find a feature that the manufacturer has demonstrated, the manufacturer's demonstration may not be understood by you. You may not understand exactly what that feature he's talking about does, and you won't understand it until such time as you start using the equipment yourself.

I've mentioned what word processing offers. It offers improved productivity, that is to say you'll be able to get more work done with the same number of people or the same amount of work done with fewer people typing it or even editing it. The next thing it does is to reduce the amount of time that it takes for the typist to do it. Typically when typing on a word processor when you put the original in, the amount saved is not more than 10 per cent to 15 per cent. Some people I know have claimed higher figures than that for the original typing work. It's when you come to the corrections that the turn around time becomes vastly reduced. You may have forgotten a paragraph or you may have put a paragraph in where you didn't really want it, you have to put it in somewhere else, and it requires a typist retyping two, three or maybe four pages before she gets to a break where everything fits, and then everything must be proof-read. On a word processor, this doesn't happen. The turn around times both for the typing and for your proof reading are very greatly reduced, and you get better quality. You have fewer mistakes, typically, in a document produced on a word processor than in one produced on a typewriter. If you have to send out two or three copies of something, they can all be originals and it doesn't cost you anything more than just the paper and a little bit of time on the machine to produce three, four or five originals. The thing you mustn't forget is the reduction in author time.

Finally, it turns out that in most cases, typists like it. In most installations where word processing equipment has been introduced, typists actually prefer it to their typewriters, because it's a lot easier from their point of view. One of the things for example that a typist does is that when she's typing a line towards the end of the line her typing speed actually slows down because she's anticipating the end of the line and a similar thing happens when she gets to the end of a page. On a word processor this doesn't happen because the equipment automatically allows for the margin and in most cases pages don't really mean anything to a word processor because they regard text as documents. Indeed in these terms a page is difficult to define.

What sorts of word processors are there available today? The first sort that I'd like to talk about is what are called stand-alone systems. A stand-alone system is typified by a configuration such as this. As with any other word processor it has some sort of input and display device for keyboard, typically a television-like screen and a typewriter keyboard underneath it. Unfortunately most of the typewriter keyboards tend to be in the normal typewriter layout which is called 'Qwerty' by the first six characters of the top line of alphabetics, which of course is different in France and different in Germany but we're stuck with that, unfortunately, because of the people who invented the typewriter. It has logic to assist the typist with the typing process. It also has some type of storage and clearly it has a hard copy output device—a printer. That is a typical stand-alone word processor. You might find optional extra features on a stand-alone word processor—you might find an extra disc drive, for example. A floppy disc today can hold something in the neighbourhood of a half million characters and you might find you have two such units so that you could hold a million characters for immediate access. The floppy disc is a magnetic disc about the size of an old 45 rpm record. Now you will find with stand-alone equipment that you can only access 1, 2 or maybe 3 or 4 such discs and therefore immediate access at any one given time is to something in the neighbourhood of 2 million characters, so an extra disc drive can be a very advantageous thing to have. Another optional extra is the communications interface. Another might be an output to a photo typesetting device and finally you might have some kind of calculation mode to assist you in typing columns of figures.

Stand-alone systems tend to meet the needs of a small office. You may find that freelance translators, for example, would be more inclined towards a stand-alone system than they would to a large shared facility system, which I'll talk about next. And they are also good for people who just want to try word processing to see if and how it can help them. Now I'll talk about shared facility systems. The facilities of the word processor are those things we've just talked about—the storage, that is the discs, the logic—both the hardware and software, that is the technology and the program

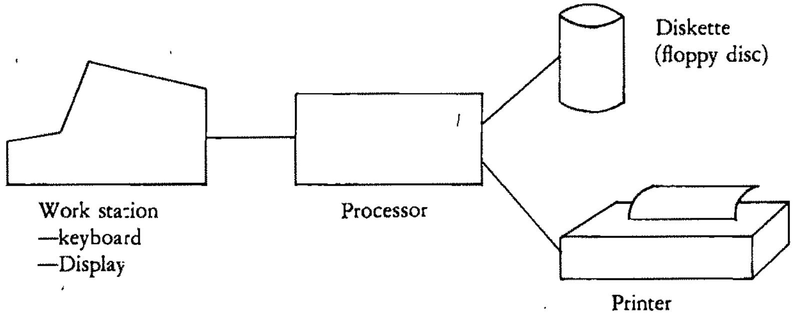

FIG. 3 *Stand-alone system—basic configuration*

to assist the typist, the printers and the communications interfaces. All of these things can be shared by a given machine. One typical example, you might have a set of work stations out here, each of which is being used by an individual typist, a central processor which is driving the work stations, ie it has the logic in it to assist the typist, and it uses a file management sub-system and a printing sub-system and this is a sort

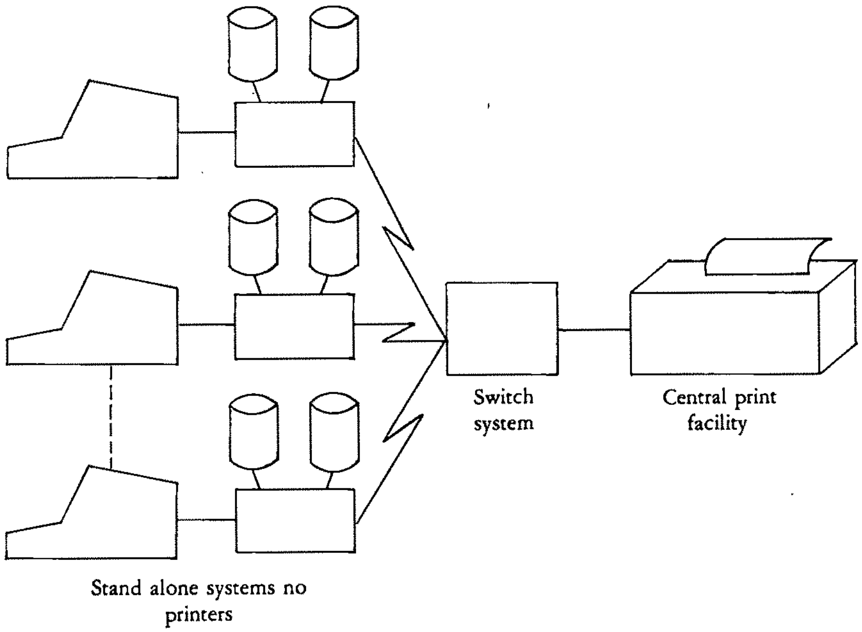

FIG. 4 *Shared printers with communications sub system*

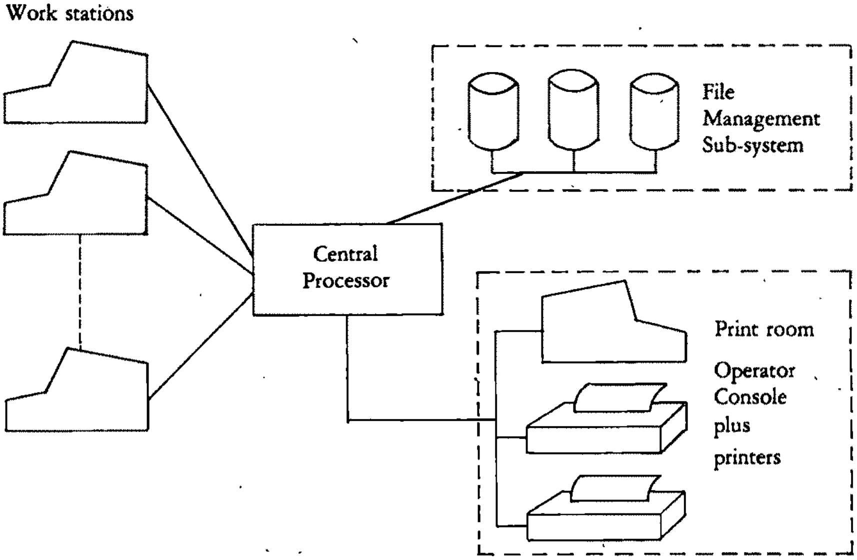

FIG. 5 *Shared logic/typing pool system*

of typing pool environment of word processor, although having said that, one of these work stations could possibly be on someone's desk somewhere else, outside the typing pool area, since there is no necessity for them all to be in one place. So fundamentally that is the kind of system that is referred to as shared facility. There are other examples—see Figs. 3–7.

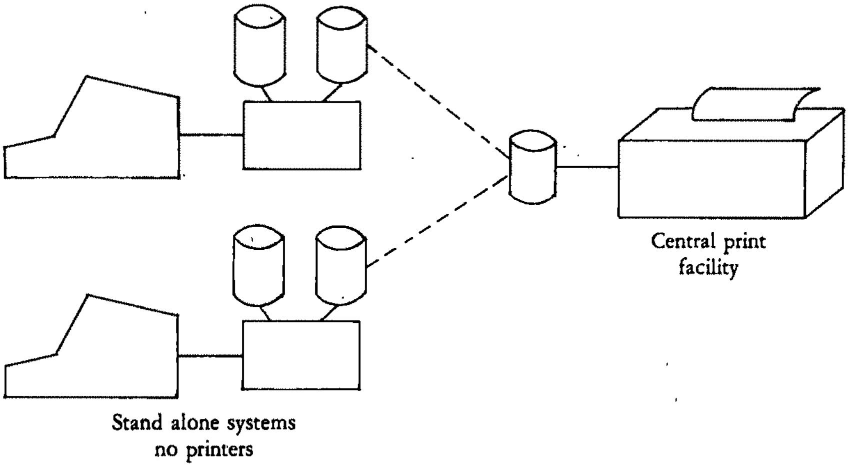

FIG. 6 *Shared printer system (text for printing transferred by manual transportation of the storage media)*

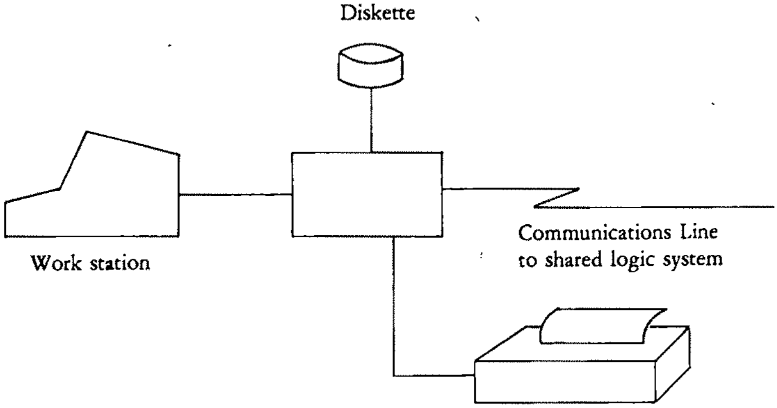

FIG. 7 *Remote outstation*

	Range	*typical good figures*
Stand-alone	0.8–2.2	1.3–1.8
Shared logic	1.2–4.0	2.0–3.0

FIG. 8 *Word processing—productivity*

We've talked about productivity gains and gains in the amount of time and the amount of work that can be performed. What sort of gains would you expect from word processing equipment? A shared facility system—a shared logic system as it's sometimes called—is better than a stand-alone system because it alleviates the problem of housekeeping. As I said before the discs that you have contain a fixed amount of information, say; half a million characters. If you've got more than that number of characters, and most of you probably have, most people would say that's about 100–200 pages—a page is difficult to define. However they have a limited amount of information, whereas a shared facility system, sharing that disc sub-system, might have hundreds of millions of characters of information accessible right now from any one of the terminals and therefore it alleviates the housekeeping problem of taking care of those discs and therefore you would expect the productivity to be greater than you could expect in a stand-alone system. The reason that the number in Fig. 8 (80 per cent) is lower—that is to say with the same number of people and word processors, I got 80 per cent of the amount of work done than I got done before—is because of the housekeeping problem, the problem of floppy discs and the filing of them.

Now we've talked about word processors. What else is there around that might help translators? (See Fig. 9). The first thing that I have listed in Fig. 9 is optical character readers. There are machines around today that can read typewritten text and store it electronically somewhere, normally magnetically. The use of these things is fairly obvious in as much as if you have a typewritten script or a typewritten document

- ★ Optical Character Readers
- ★ Video Disks
- ★ 'Bubble' Memory
- ★ Voice Response
- ★ Speech Recognition
- ★ Electronic 'Phrase Books'

FIG. 9 *Other machine aids*

and you wish to put it on to your word processor, it's much easier to get it on by an optical character reading device than it would be to re-key it.

Another item is a video disc which is a disc which essentially stores images and it stores images in much the same form as a television picture and these images can be re-displayed on a television-type screen. The recording mechanism of the video disc is actually a laser and it can store millions and millions of pages on one very small gramophone record size disc; it could store complete dictionaries that you might need for translating more technical items for example.

Another feature again along the same lines of storing information, storing and retrieving information like dictionaries, is the advent of what is called bubble memory which is a bubble of magnetism floating around in a silicon chip and it can be used, generated, retrieved and saved in this little tiny chip. They come about 7½ cm × 7½ cm and there may be 10,000 characters of information on a chip about that size. Voice response units are devices which respond with a human voice to an enquiry on a machine, these could be more useful to interpreters, perhaps than to translators because if you get into some technical terms which again, you may not necessarily be familiar with, the voice response unit could give you the appropriate pronunciation of that term.

Then there's speech recognition. Speech recognition is an interesting affair because today what we recognize in machines is what's called discrete speech, which is to say you have approximately 20 or 30 or maybe 50 or 100 words, that is words or phrases, that the machine recognizes and can translate into an electronic form. This could be very interesting if we ever get to recognizing what is called continuous speech, translated into some kind of electronic form. This actually has been done in the United States, I understand, but one of the problems is the amount of time and the amount of processor capability that it takes up. One can read a sentence into the machine at normal reading pace and the machine will actually interpret that sentence and put it into magnetic storage in a machine readable format. It takes 75 hours to do it at present, but constant progress is being made.

Finally, what about electronic phrase books? How many of you have seen the adverts recently in the *Sunday Times* magazine for Sharp electronic phrase books? Essentially you key in a word in a foreign language or in English and it displays on a screen the same word in English or the foreign language, according to which way you are doing it. They're really for tourists fundamentally and I mention them here because the idea is that you can take a calculator-size device and simply by removing one element of that device and putting in another element, you can translate from say English to French in one instance and English to German in another instance. Well, that's interesting but what good is that to a translator? Conceivably you can put in a technical dictionary for civil engineering because you have been translating civil engineering documents and a couple of minutes later you can pull that module out and insert the module for computers because it involves quite a different technical vocabulary to that of civil engineering. Therefore I think that these things can be of use even to the professional translator providing the manufacturers of them—people like Sharp and Nixdorf and Texas Instruments—feel that there is enough requirement for them and again it goes back to the question of the storing and retrieving of information and dictionary look-ups.

Machine aids: a small user's reaction

Robert Clark

Freelance translator, Cambridge

Paper presented at the Aslib Technical Translation Group conference and exhibition, London, 20 November 1980

A technical survey of the kinds of equipment that may improve both the quality and quantity of a translator's work is followed by consideration of the new conceptions and attitudes imposed by such equipment. The importance of motivation and other psychological factors is discussed, and the need for greater attention by manufacturers to human factors is stressed. Finally, a plea is made for improved telecommunication facilities and media compatibility between systems of different makes.

MY REACTION TO word processors? All in good time. First I thought I would brighten your day with a cutting from *The Guardian*. (Overseas visitors may not have heard of the *Guardian*'s reputation for classic misprints.) In the *Guardian* of 15 October 1980, page 15, an article by Hamish Macrae refers to the 'world processor'. This misprint will be seen by some as prophetic: . . .the *world* processor! A fascinating thought. But if we define a person's world as their life and work, and a processor as something which brings about changes, that misprint is not so far from the truth.

Telling someone you are a translator is a guaranteed conversation-stopper—except in the unlikely event that the other person is a translator as well; that guarantees *plenty* of conversation, especially if, like me, you believe that translating can be done quicker and better with the help of some of the electronic aids around today with two—or even ten—fingers and a typewriter, and the person you are talking to disagrees.

I am described as a 'small user'. I could hardly be smaller without disappearing altogether, since I operate as a freelance translator and have no employees. (My typists work on a casual basis.) But I could not produce the quantity (or, for that matter, the quality) of translation work that I do, without reliable, specially-adapted dictating machines and powerful, well-designed text processing equipment.

A quick personal outline for those who do not know me: I translate into English from Swedish and German (mainly) and Dutch and French (occasionally). The work normally has the central theme of 'technology'. It is mainly in the form of technical instruction manuals, brochures and catalogues for industrial plant, electronic equipment, and so on. Most of the work comes from Sweden and Germany, some from other countries; some comes from direct clients, some from agencies. They all have high standards, and expect the same of the freelances who work for them. To keep my clients I have to produce work that meets their standards not only linguistically but also in its presentation. And I have to meet their delivery deadlines as well. Of course this can be done with a typewriter, but I maintain that it can be done far better

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with a word processor. Even so, there are disadvantages, and because they are not so evident, I shall devote at least as much time to those as to the advantages.

I now have an annual output of well over half a million words, and today I plan to talk about the machine aids that have made this possible for me, and the techniques I use. Of course there are people who achieve such an output by conventional means, but I would certainly find it hard to do so, especially while maintaining a high standard. Translators are an individualistic breed, and I have found that personality counts for a great deal in translating. What is right for me may not be right for another translator.

The basis of my relatively high output is dictating. I am convinced that dictating is the most efficient way of translating. It is a technique that many translators find hard to acquire, but those who master it seldom abandon it. I fail to understand how anyone can be a successful full-time freelance without learning this technique.

The dictating equipment I use does away with the hand microphone which I used to find such a nuisance: I was for ever putting it down to use reference books and make notes, and then having to pick it up again before continuing. What I wanted was 'hands-free' dictating. When I first saw the machine I now use, what interested me about it was the desk-top microphone unit for use at meetings and so on. Although it had pushbuttons to control the machine, it also had a socket for a foot control. This was what I had been looking for for a long time. The final link was left to my ingenuity. I bought a set of headphones with a boom microphone—the sort used by aircraft pilots, air traffic controllers, telephone operators and so on—and slightly modified the dictating machine to accept it. The headphones also reduced the level of extraneous noise, making it easier to concentrate. The foot control covered all the functions of a hand control. This was my first specially-adapted machine aid, and I think its application in this form to translating is an innovation. I should be interested to know whether any other translator uses a 'hands-free' dictating method.

Broadly speaking dictating is twice as fast as typing the work yourself, especially if you are not a touch-typist. But the product is a tape, and this has to be typed. Typists cost money and good ones (who can tell when to put 'affect' and when to put 'effect', for instance) are difficult to find. Another problem with dictating is that once you have committed yourself it is difficult to make changes on the tape, and impossible to make additions, as they would erase subsequent dictation. These problems can be overcome with a word processor, if it is properly used.

Hardware

What kinds of word-processing machine aid might a freelance translator consider?

Automatic typewriters

These are basically a conventional electric typewriter connected to a memory and storage unit which stores the text on a medium such as a magnetic card. Corrections can then be made and the corrected page reprinted. As each magnetic card stores one page of text, handling and storage of the cards becomes a major task if translations of any size are being handled. Paper consumption is as high as with conventional typing, since each corrected page has to be printed twice. The printing speed, though better than that of a fast typist, is relatively slow, and the machine cannot be used for other work while it is printing. I would not recommend a machine of this type for a translator.

Screen-based word processors

As their name implies, these machines have a screen which displays the text as it is typed, or as it is called up from the storage medium. They are of two main kinds: stand-alone machines and shared-logic machines. A stand-alone machine is completely self-contained, and is made up of keyboard, screen, processor, storage device, and printer. Shared logic systems have two or more work stations (ie screen and keyboard). A small user such as a freelance translator is likely to be interested mainly in stand-alone machines, though if throughput is consistently high there may be a case for having either a shared-logic system, or, in addition to the stand-alone machine, an input station (this is a word processor without a printer).

Stand-alone machines may not be so well suited for large organizations. For such applications there are likely to be benefits in having a shared-logic (shared-facility) system with a large amount of on-line storage. This is outside the scope of this paper.

The main advantages of working on a screen rather than on paper in a typewriter are:

(a) Mistakes are easy to correct, and nothing ever has to be retyped. A common mistake in copy-typing is to jump from a word or phrase to the next occurrence of that word or phrase—perhaps several lines later. Of course this means retyping, but not on a word processor. The typist simply returns to the point where the passage was omitted, and types it in. The text on the screen opens up to make room for the addition. The speed and confidence of the typist are increased.

(b) Another example: if the text is found to have been keyed in with the wrong margins, tab settings, pitch and so on, it is simply a matter of changing the relevant commands, and the text adjusts itself to the new layout. Similarly, an inexperienced operator who is unfamiliar with formatting (ie layout) instructions can be asked to type the text without them and they can be added later, perhaps during checking.

(c) Repeated matter need only be typed once. Any piece of text, once typed and stored, can be re-used over and over again, not only at the time, but days, weeks, or even months later, and can of course be revised at will. For instance, consider a series of tables that recur on several pages, each with the same column headings and tab settings, but with different matter in the columns: on a typewriter each page would have to be typed as a separate entity, and if the work were interrupted and the typewriter were used for some other work in the meantime, the tabs might all have to be reset. With a good word processor, the complete table heading can be recalled as often as necessary, at any time, together with all the necessary tab settings.

(d) A translator who deals with documents that follow a set pattern, such as data sheets, standards, specifications or annual reports, can translate the basic text (the text in which there are few or no changes from one document to the next) once only for repeated use, and need only translate the variable text.

(e) Tabular and column work is easier, provided the operator is prepared to master the techniques.

It is easy to describe these features, but they cannot be fully appreciated until they have been experienced first-hand. It is important when watching demonstrations of word processing equipment to be both critical and imaginative. The demonstrator is not a translator, and though you may show examples of work, and the salesman may say, 'No problem, our machine can do that standing on its head,' it is not the specimen of finished work that counts in that situation, but the process by which the result is achieved. The salesman sees only the sheet of paper you show him, and visualizes it as a copy-typing task, but the unique aspect of typing for a translator is the existence of the source text, and the fact that the typist has to combine audio-typing with scanning the source text for layout and so on. This is unlike most word processing applications.

I am strongly in favour of a screen which shows as much as possible of a page at once. Salesmen whose machines show only half a page will tell you that tests have shown it is not necessary to see more at a time. I do not agree. It is useful to be able to display a good width as well, say landscape A4.

More than any other factor, it was the versatility of the screen that sold me the machine I use.

Most screen-based systems will allow you to work on to the screen while the printer is running, though there may be a few minutes' delay at the beginning of a long print job.

Deciding on a system

I do not intend to deal with the financial aspects of acquiring and operating a word processor in this paper. Translators and their circumstances differ so greatly that it would be inappropriate. Nor shall I be talking of percentage increases in output or savings in typing time. I do not think in those terms. My advice would be to talk to users and make up your mind on the practical aspects first. Ask yourself whether you could adapt to working with a machine of this kind; many people have an irrational aversion to even the simplest technological devices; your typist may be one of them. You need to be enthusiastic and highly motivated to make a success of it, because it takes time to master the techniques, and it can be very frustrating at times. Only start thinking about the economics when you are quite sure you (and your typist if you use one) could get on with a word processor.

Points to consider

(1) *Do you type your own work or do you use one or more typists?*

A freelance translator considering word processing should look carefully at his current working methods and decide how and where a word processor would fit in. It will almost certainly lead to changes.

I know two established translators who cannot understand why I use a word processor. They dictate their work, and send it out to typists who work at home.

Their clients are prepared to accept typed work with handwritten corrections, and neither translator sees any reason to change the system. Many freelance translators use similar arrangements, and if you are one of these and you get a word processor you immediately face the following problems:
— your typist has to come to the machine;
— you can only use one typist at a time;
— you cannot use the machine (for glossary work or for checking, for example) while the typist is working.

You are likely to find yourself working on the machine when it is free, perhaps in the early morning, or at evenings and weekends. It is a matter of organization: if your output is 3000 words a day, your typist may take 4 hours to type this on the word processor, leaving you 4 hours of an 8-hour day to check and print the work. But to do this you need a good, committed typist, and the work must be straightforward. Complex layouts or tables disrupt this pattern. Even if you can persuade a typist to come to the machine instead of working at home, she will have to be trained, and it is far from certain she will take to it. In my experience, the rule seems to be: the more accustomed a typist is to a conventional typewriter, the less likely she is to adjust easily to a word processor.

(2) *What kind of work do you do?*
In theory anything that can be done on a typewriter can be done on a word processor, but I have yet to see a word processor that can cope well with formulas and equations, or even one that shows superscripts and subscripts properly on the screen.

(3) *What form of presentation do your customers want?*
Customers may indeed be 'prepared to accept typed work with handwritten corrections', but they might be delighted to accept work without a single correction, and to have the opportunity of getting a new printout without retyping if they wish either to alter the source text, so that the translation must be altered correspondingly, or to alter the translation, for reasons of their own. This must be a selling point, at least with customers who are aware of the possibilities of word processing. Most of my customers require a standard of presentation equal to or better than that produced within their company. It is a matter of professional pride with me to supply work to camera-copy standard at all times.

Operator adjustment

A word processor is not a typewriter, and ought never to be seen as one. It is a special kind of computer, a dedicated computer, in the jargon, and to use it successfully the operator must realize that he is not a typist but a programmer.

When you type on a typewriter a character appears on the paper whenever you hit a key. That operation is a single event—a mechanical operation, not a program. When you type text on a word processor you are keying in a program, a series of instructions for the printer. Like any program, these instructions can be checked, modified, copied, manipulated—in a word, processed—before they finally reach the printer, and subsequently, of course.

Because the word processor interprets its instructions literally, and is totally intolerant of human error or vagueness, the instructions you give it must be perfect. There is no room for error. On a typewriter you see your mistakes as soon as you make them; you can then correct the page or retype it. Not just typing errors, but layout mistakes as well. On a word processor some errors may not become apparent until you finally print out the work. One major cause of difficulty has to do with line spacing. Most screens show only single spacing in running text. Special commands are given to obtain one-and-a-half or double spacing, but the text may not show the different spacing on the screen, only on printout. It is surprising how frequently extra half line spaces are used in text. A related problem is that subscripts and superscripts may not appear as such on the screen, though again they can be obtained on the printer by entering special commands.

When you put a blank sheet in a typewriter you immediately make a decision: where is the paper to be positioned along the platen? This will affect where the margins will be set. On a word processor, there may be technical reasons for not positioning the paper towards the left, as one normally does in a typewriter. It may have to be in the middle. This may have to be allowed for when keying in any formatting commands. You have to think in terms of 10, 12 or 15 pitch—the number of characters per inch, and work out the margin and tab settings in terms of numbers, whereas on a typewriter one generally sets them mechanically by eye. It helps to visualize a page as a grid on which each character position is defined vertically by a line number and horizontally by a character position number.

To save a great deal of measurement and calculation, I have had transparent overlay grids drawn (a section of the 10-pitch one is reproduced on paper in Appendix 1) which can show the horizontal and vertical positions of any character on a page. This is particularly useful with translation work, since one often has to work to the layout of the original, leaving gaps for illustrations and so on.

All these instructions must be given to the machine via the keyboard in the form of command codes, and it is this that can give rise to operator adjustment problems. For some typists it involves too much thought, or rather, a new way of thinking. It is unsafe to assume that a good conventional typist will be a good word processor operator. Quite a different mentality is required.

You may wonder what can be so difficult about it. The difficulty lies not so much in the machine as in the common human aversion to the unfamiliar, the new, the different. People still struggle with the 24-hour clock, and it will be decades before metric weights and measures are fully accepted. Most of us still hanker secretly for good old pounds, shillings and pence: 'real money', we call it. The difficulty comes not in learning something completely new, but in having to unlearn a skill that has become part of you.

Translation techniques

When I translate, I adopt what I describe as the 'creative' approach. Many fellow-translators disagree with me when I describe translating as a form of creative writing, but I maintain that when I translate, I am creating a new piece of English, on the basis of the meaning conveyed to me by the source text. I am trying—as best I can—to write what the author might have written if he had been English. Like all writers, I need to go over what I have written. This is not just a matter of 'polishing the style', though that certainly comes into it. There may be passages that were ambiguous in the original and that need to be edited in the light of new information; technical terms may need to be changed throughout the work, and so on.

My aim in purchasing the text processor was to progress from the 'dictate—type—check/edit—retype' pattern to the 'dictate—type (on machine)—check/edit (on screen)—print' pattern. See Appendixes 2 and 3.

Appendix 4 shows in detail how a freelance translator might work with a word processor. WP in the right margin indicates use of the word processor.

Glossaries

With a word processor it is an easy matter to compile lists of technical terms—glossaries—in two languages. To me this is one of the greatest benefits of the machine. Working for many different customers makes it difficult to keep their preferred terminology in one's head, and I make a practice of keeping glossaries for each client or, if the client is a translation agency, for each ultimate client.

I am often asked whether the machine will arrange word-lists like this in alphabetical order. It doesn't, and I do not need it to. The glossary is built up entry by entry as the work progresses, and entries are simply added at the correct alphabetical position. The advantage of doing this on a word processor is that when a new entry is added, the existing text opens up to admit it.

Usually the client receives a copy of the glossary with the work. This helps to keep terminology uniform throughout their publications. If I receive any more work from the same client, the glossary would be added to, and the updated version sent.

Problems and prospects

When I was deciding which machine to buy, almost all my clients with word processing systems thought I should buy the make of word processor they had bought. I would have had to buy three or four machines to satisfy them all! I decided to buy the one I liked best. But my clients and I find the incompatibility between different systems very annoying. Surely word processor sales would increase if all systems used a common standardized medium so that work done on one manufacturer's system could be processed on another's. It is almost always impossible to transfer the medium (usually a floppy disc) from a system of one make to a system of another make. The state of affairs is similar to that with video tapes, with several systems vying for market dominance. There ought to be some standardization in this field. The problem can be overcome by transmitting data from one machine to the other via-telephone lines and modems, but even this is apparently not without its problems, and can be costly. Anyone who is enterprising enough to offer a disc conversion service could do very well.

The voice of users is not heard loudly enough in the word processing world, and it is time there was an organization to put pressure on manufacturers for greater standardization, not only of media formatting, but of terminology such as command code names. Some makers use delete, other erase, others rub out, and so on.

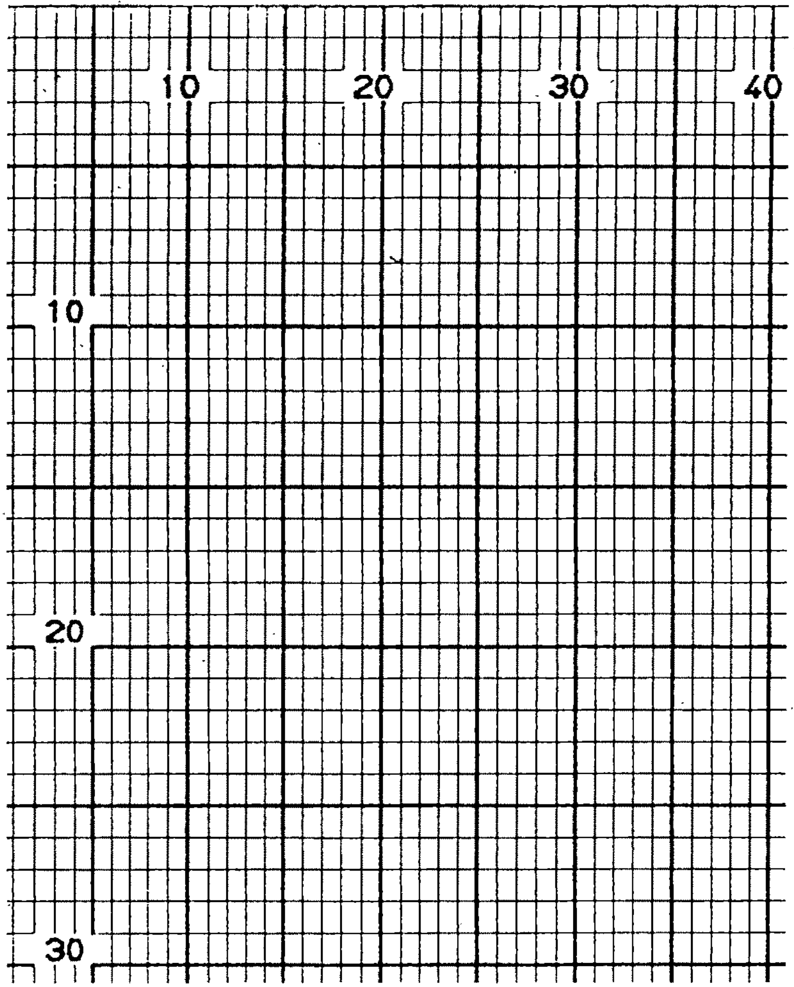
You wanted to hear my reaction to machine aids, especially word processors. I hope it has emerged from what I have said that my reaction is, in two words, 'terrific, but . . .'

As you can tell, I am very enthusiastic about word processing, but it seems to me that they are about where aircraft were in 1930. I doubt whether we shall have to wait fifty years for them to advance by the same degree as aircraft have!

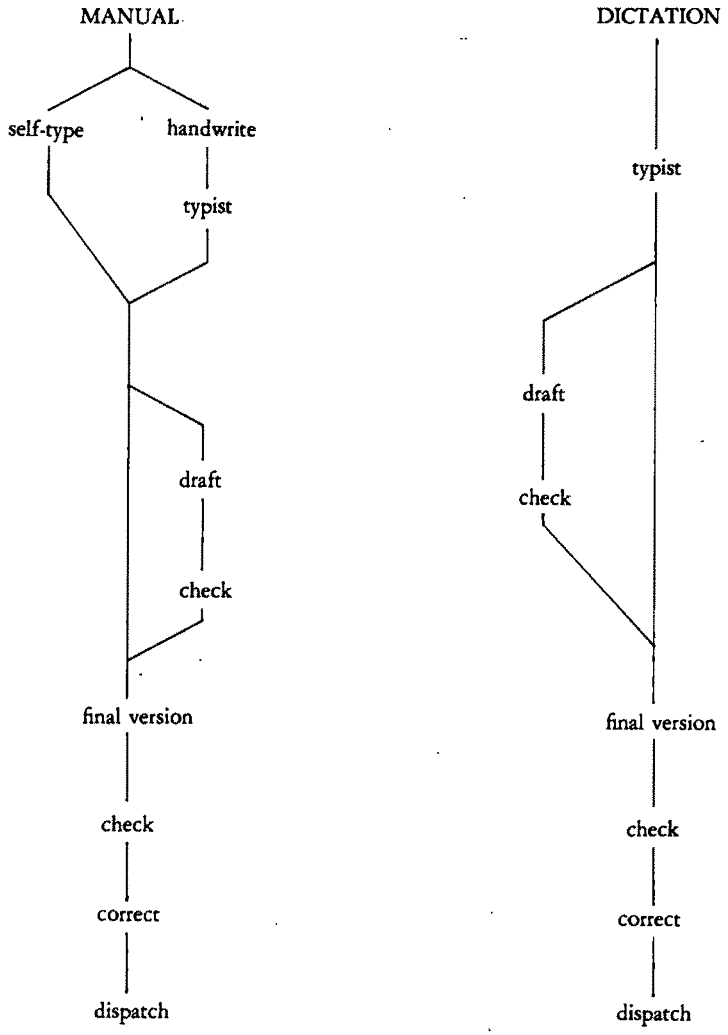
Designers of both hardware and software need to be more open to the psychological difficulties of working with such machines; they need to pay even more attention to human factors. Many word processors ask too much of the user's memory, and do not always show the text on the screen exactly as it will appear when printed. Users need more feedback from the screen to keep them informed. But users also need to adapt, and develop the flexibility of mind to cope with word processors. Future users—now at school—need to be taught a less rigid view of text as simply ink on paper. They are going to need to work with text on a screen—what I call 'liquid text.' It is only when you have worked day after day with a word processor for some time that your conventional concepts break down and you begin—little by little—to glimpse the possibilities.

I recently heard it said that word processors are to typewriters what telephones are to pigeons. I wonder whether the typewriter will survive as well as the pigeon has.

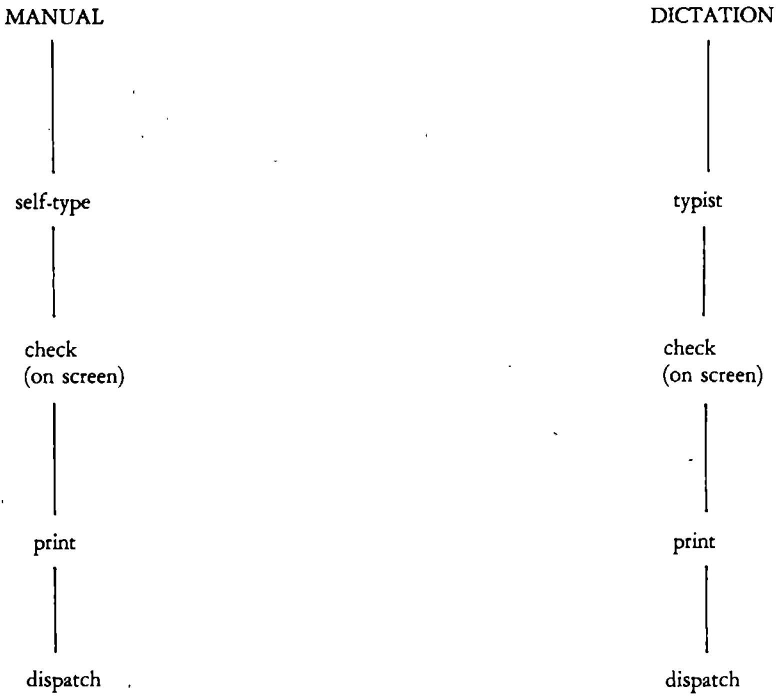
APPENDIX 1 *Section of 10-pitch layout grid (The actual grid is transparent)* © Robert Clark 1980



APPENDIX 2. *Translator work methods—pre-WP*



APPENDIX 3 *Translator work methods—with WP*



APPENDIX 4. *Freelance translator: work pattern*

(1) *Source text received*

(2) *Book in* (possibly count words)

(3) *Start work*

- 3.1 Scan work
  - 3.1.1 Decide on breakdown into sections, if job is large
  - 3.1.2 Establish readership, style etc
  - 3.1.3 Create basic glossary *or* call up existing glossary for related work — WP

(4) *Dictate*. While dictating:

- 4.1 Refer to glossary — WP
- 4.2 Add to glossary — WP
- 4.3 List items to be changed on editing (notepad)

(5) *Typing* — WP

The typist works directly on to the word processor screen from the tape, with the source text as a layout guide. The typist should check for ordinary typing errors.

NB: The text is not printed out at this stage. It is stored on a floppy disc.

(6) *Checking*

Concurrently:

- 6.1 Check for typographical and layout errors — WP
- 6.2 Make changes listed during dictation (see 4.3) — WP
- 6.2 Check text for clarity — WP

(7) *Printing*

At present, normally done by translator, but ought to be done by typist.

- 7.1 Scan completed printout, decide if any pages need alterations and reprinting—reprint.

(8) *Invoice* (WP) and despatch

(9) Await payment!

Translating and online

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Paper presented at the Aslib Technical Translation Group conference and exhibition, London, 20 November 1980

Information can be retrieved by direct interrogation of a remote computer by means of a keyboard terminal and a telephone. The advantages of such an online system are fast access to large quantities of data and the opportunity to refine the enquiry by conversing with the computer. At present, data bases can be used to determine if a translation of a document, or an alternative, already exists. They can assist with translating particular words or phrases, especially in new subject areas. In the future, online systems may be exploited to produce more sophisticated aids, reflecting the structure of language.

THE ENGLISH WORD is 'online' and its French equivalent 'conversationel'. Although the main topic of this paper is how information transfer via online searching can enhance translation, I cannot resist the opportunity to start with this example of the reverse case—how translation may enhance information transfer. 'Online' merely states that you are in direct contact with a computer; 'conversationel' implies that two-way communication is possible between you and the computer. The latter is nearer the truth. Online searching can be defined as the process of interactively searching for and retrieving information by computer from a machine-readable database.[1]

Why should interaction be a desirable feature of computer use? Our chairman remarked during the 1978 seminar on 'Translating and the Computer' that 'if translators are to coexist with computers, we must become actively involved in directing their uses, let us be the masters and they the tools'.[2] Using the computer in an online mode helps us to achieve this control. It is well known that computers will only do what they are told. If an enquiry has to be formulated in a very complex language before it can be put to the computer, and this formulation involves computer scientists and a long delay, then *we*, non-computer scientists, do not have control of computers. Online searching allows us to put the questions in simple language. If you happen to phrase the question in the wrong way or if the computer does not have the information you require it will tell you so, immediately and, more or less, politely. You are then in a position to correct the question. Online searching is understandable and therefore controllable.

In this paper I shall be asking the following questions: what is online? why is it useful? how does it help translators? where can you obtain access from? and how much does it cost?

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Online information retrieval

For the benefit of those who are not familiar with the concepts underlying online information retrieval I will give a brief explanation and hope that those to whom this may appear simplistic will bear with me.

The user of the online system constructs an enquiry to be matched against the collection of information in a database. Some people have drawn the distinction between databases, containing bibliographic references, and data banks, containing non-bibliographic information. For our purposes today, I will not bother about this distinction and will refer solely to databases, meaning by this structured collections of any kind of information in machine readable form. Depending on the response to the enquiry, the user reformats his enquiry or modifies its scope until he is satisfied with the information retrieved.

Communication with the database takes place via a keyboard terminal with a screen and/or a printer to display the interaction and the results. The data bases exist on computer discs made available by search system suppliers. Typically, each search system supplier will have a computer and will offer access to a number of data bases. The interposition of a telecommunications network between the user's terminal and the computers has revolutionized the accessibility of the databases. Users make what is usually a local telephone call and link their terminals to a network, which allows them to connect to computers anywhere in the world. One network, the International Packet Switching Service (IPSS) links UK users with computers in the USA (and vice-versa) and another, EURONET, links users and computers throughout the countries of the European Community.

Advantages of online

Among the chief advantages of online is the ability to modify the enquiry as the search progresses. Another advantage is the large amount of information that can be stored on computer discs. More access points to the information are possible when it is in this form rather than when it is subject to the limiting factors of the printed form, physical volume and type-setting costs. Thus in a printed book, access to the contents is made via the index; with an online equivalent, every word in the book could be searched. Retrieval of information online is also fast, a matter of minutes rather than hours or days. The information can be kept up to date easily because of the possibility of merging new items into the existing database.

Online as a tool for translators

The crucial question from your viewpoint is how online systems may help translators. Professor Sager in 'Translating and the Computer' outlined the stages of decisions and actions involved in the production of a translation.[3] Online can be used in the first two of these: deciding whether to translate or request a translation, and preparing the rough translation. The data bases which can be exploited for these purposes are diverse in nature. They include the currently small but ever growing number designed specifically for people concerned with translations and the hundreds primarily aimed at information retrieval specialists in specific subject areas. The relevance of the former group will be obvious but the usefulness of the latter group resides in the extent to which data base producers gather and make searchable multilingual information.

The first two stages of translation referred to above cover five different areas in which online data bases can aid translation.

(1) *Deciding whether a translation is required*
During the production of many data bases, material in many source languages is abstracted by linguists into the target language of the data base, usually but not always English. If the candidate document for translation is published, it is worth checking to see if an abstract exists in one of the online data bases. If so, the information content of the abstract might render a full translation unnecessary. Of course, there is nothing new in this approach. However, whereas previously searching for an abstract might have taken several hours and might therefore have been deemed not worthwhile, an online search can in a matter of minutes determine whether or not an abstract exists. Millions of references can be scanned for the combination of authors' names, title words and journal title which identify a particular paper. Because publicly-available data bases usually cover only published material and because, it must be admitted, the information content of abstracts varies between data bases, the usefulness of this approach is limited yet should not be overlooked.

(2) *Finding if a translation already exists*
The same databases may also be used in finding whether a translation already exists, if it is likely to be in one of the cover-to-cover translated journals that exist in certain subject areas.

More relevant, however, may be the World Transindex (WTI) which has recently been made publicly available online as file 33 of the Information Retrieval Service (IRS) in Frascati, Italy. This is accessed from the UK via the Dialtech Service of the Department of Industry. WTI holds details of translations collected since 1978 by the International Translation Centre in the Netherlands and the French Centre National de la Recherche Scientifique (CNRS). These include translations of scientific and technical literature from East European and Asiatic languages into Western languages and also translations of other Western languages into French. Because the information is online it is easy to provide a large number of access points to the information such as type of documents, target and source languages, publication year, title and subject index terms. Figure 1 shows a typical record.

PRESENT AND FUTURE UTILISATION OF SOLAR ENERGY IN THE USSR
Russian into English
MALEVSKI (I.M.); TARNIZHEVSKI (B.V.)
GBR; Date: 1979;
UK-USSR ENERGY SYMPOSIUM/1979–10/MOSCOW; SUN; Date: 1979;
Type: TS, LM, MV, XC, ZM
CC: 903.J.02
DS: ENERGY/ENVIRONMENTAL SCIENCES

FIG. 1 *Example of a record in the data base World Transindex*

An example of a search would be to find details of translations of articles published in 1980 on solar energy from Russian into French. At present this is a fairly small database but it illustrates the possibilities inherent in online systems for sharing the collections of specialist centres and making them available over a wide area.

(3) *Gathering information in the subject area of a translation*
Information gathering may form one of the preliminaries of a translation if the translator is working in an unfamiliar area or if the subject of the translation is particularly recondite. An abstract of the paper, if it exists, may provide a valuable starting point, even if it is not considered to be full enough to act as a document surrogate. Interrogation of the same subject specific-data bases may reveal a review that will provide the necessary background.

(4) *Terminology*
By providing access to remote terminology banks, online makes its potentially greatest contribution to aiding translation. These data bases are like computerised dictionaries in that they provide equivalents of terms in a number of languages. However, not being limited by having to be produced in printed form, they can also include descriptive information for each term-equivalent pair, including usage samples, synonyms, definitions and grammatical information. Inclusion of the context of a term is particularly important in scientific and technical fields.

The other major advantage is that terminology banks can be frequently updated with new technical terms. Translators have to deal with newly-developed situations, processes and materials. Dictionaries cannot provide this sort of information as the time lag between editions is too long, a minimum of 2.4 years, even in such fast-moving fields as electronics.[4] The alternative is to consult other translators or foreign specialists or research the topic in detail to be able to deduce the meaning, a process which can take up to 60 per cent of the total translation time.[4] So the dissemination of new terminology via online data bases can provide a much-needed aid to translation.

As one of this afternoon's papers will deal with a terminology bank in detail, I will limit any further comments on the subject to mention of the European Community's terminology bank EURODICAUTOM, which is now publicly available via EURONET from the ECHO service of the CEC. Although there is currently much international activity in the area of producing standardized terminology in machine-readable form, encouraged and co-ordinated by Infoterm,[5] EURODICAUTOM appears to be the only terminology bank publicly and easily available at the moment.

The bibliographic databases, however, contain a great deal of multilingual information which can be used in a similar way and have the advantage of being ready now. Databases covering such diverse areas as sociology, engineering and agriculture, (such as Sociological Abstracts, COMPENDEX and Commonwealth Agricultural Bureaux Abstracts), all carry article titles in the original language of publication, each significant word of which is searchable, as well as their translations (see Fig. 2). The pairs of titles show the term in question in context, which provides an important check on meaning. Data bases in languages other than English, if they still contain English titles, provide extra help in the form of non-English abstracts and indexing terms. PASCAL, a multidisciplinary French data base, is useful for such purposes (see

0F041–00533 Forestry Abs
Investigations on the pine weevil (Hylobius abietis). I
Snytbaggeutredningen. I

0F040–04660 Forestry Abs
A collar against Hylobius abietis
Med kragen mot snytbaggen

FIG. 2 *Examples of translated titles in the data base Commonwealth Agricultural Bureaux Abstracts*

PROSTACYCLIN INHIBITS MOBILISATION OF FIBRINOGEN-BINDING SITES ON HUMAN ADP-AND THROMBIN-TREATED PLATELETS
HAWIGER (J.); PARKINSON (S.); TIMMONS (S.)
AFF: VANDERBILT UNIV., SCH. MED., NASHVILLE TN 37232, USA
NATURE: GBR: Date: 1980; Vol: 283; No.: 5743; p.: 195–197; 23 REF.;
Cote: 142; Langue: Anglais Type: TP, LA
CC: 361.B.22.B.02
DS: PROSTAGLANDINE 12/INHIBITION/FIXATION/FIBRINOGENE/ THROMBOCYTE/COAGULATION SANGUINE/METABOLISME/ HORMONE LIPIDE/HOMME
L'ETUDE DES EFFETS DE LA PROSTACYCLINE SUR L'INTERACTION DU FIBRINOGENE AVEC LES PLAQUETTES HUMAINES MONTRE QUE LA PROSTACYCLINE INHIBE LA MOBILISATION DES SITES DE FIXATION SPECIFIQUES ('RECEPTEURS') POUR LE FIBRINOGENE SUR LES PLAQUETTES HUMAINES ET QUE CET EFFET EST PARALLELE A L'INHIBITION DE L'AGRETATION INDUITE PAR ADP OU LA THROMBINE. L'EFFET INHIBITEUR DE LA PROSTACYCLINE PEUT LIMITER L'ETENDUE DE L'INTERACTION PLAQUETTES-FIBRINOGENE IN VIVO ET DANS LA CIRCULATION EXTRA-CORPORELLE

FIG. 3 *Example of a multilingual record from the data base PASCAL*

Fig. 3) and also provides access to language pairs which do not include English. Such databases also provide detailed subject classifications and indexing which are not available for multi-purpose terminology banks.

(5) *Portraying language structure*
Translators are not always searching for term equivalents but sometimes want to find words related in a different way to the one they are starting with. Working within the English language we would go to Roget's Thesaurus or a thesaurus in a special subject area which would guide us to broader, narrower and related terms. Multilingual thesauri do exist and are good candidates for online treatment. Several large volumes are required if all the possible structural relationships as well as alphabetic indexes are

to be provided in printed form. Online to such a data base, you could wander freely through a language, choosing from a multiplicity of entry points and tracing a conceptual path at will.

Of course; this assumes that the relationships between the concepts have been identified in the first place. To quote our chairman again 'it is "ideas" not "words" that we transpose from one language and culture to another'.[2] When organizing any data base for computer searching, you soon find that you have to think very clearly about the ideas behind the information. Every relationship must be made explicit in order to allow automatic processing by the computer.

If you will permit me to do a little star-gazing at this point, I would like to be able to see a time when all translators could have their personal files of information on microcomputers for online access, as some, doubtless, have at present. No longer would finding a piece of information be restricted by the alphabetical order of cards or the number of cross-references that the compiler could be bothered to write out. On the other hand, they would be forced to analyse the relationships between words and the different functions that the same word may have in varied contexts. This would indeed be an aid to translation.

Availability and costs

Coming back to earth, it must be said that online data bases will be no help unless they are readily available and cost-effective.

Translators work in very different conditions: within translation departments of large organizations, with one or two colleagues in a medium-sized company or freelance, often far from centres of information. Are online systems equally available to all?

I am afraid that I would be painting a false picture if I said this were so. Throughout this paper I have been using 'publicly available' to denote the accessibility of a particular data base to anyone who has signed contracts with the relevant system and telecommunication suppliers and who has a terminal and some means of connecting it to the public telephone network. There are many useful data bases which are not available in this way. The only thing that can be done here is to find out what exists and try to encourage the organizations who have developed data bases to share their expertise with others.

To some of you, the conditions for accessing publicly-available databases may be daunting enough. Within large organizations, it is likely that the information department will already have a terminal which can be used. A company with one or two translators might consider buying a terminal and organizing access specifically for translation purposes. The Online Information Centre at Aslib can provide details of what has to be done. For the isolated freelance translator, there is the possibility of using a middleman, an information broker, to carry out searches on your behalf. The benefits are not as great as when you are present while the search is being conducted, but the process is essentially no different from telephoning a reference library for information. The Online Information Centre can provide a list of brokers.

Cost-effectiveness is obviously important. Please note that I did not say cheapness. The costs of using online systems are clearly visible and may seem high until you realize, for example, that the time spent finding the words you want is also a significant cost factor. It might not be cost-effective for a freelance translator to have his own terminal until there is a great deal more information relevant to him from this source yet to a larger organization the increased speed of retrieval might make it worthwhile now.

What are the costs? They vary greatly and I can give only an order of magnitude. A simple terminal can be bought for under £1,000 but they can also be hired. Telecommunications charges will be about £2.50 per hour on EURONET or £10.00 per hour on IPSS. Access to the data base may cost up to £10 per hour if it is subsidized or about £30 per hour at commercial rates. Information brokers' rates will vary from organization to organization. Remember, though, that you may need only 5–10 minutes to find your information.

Conclusions

To summarize the current status of online data bases as aids for translators, there exists at the moment a small number of publicly-available data bases aimed specifically at translators or those responsible for the provision of translations. A much larger number of data bases is aimed at information retrieval specialists yet they provide multilingual information which is, at present, underutilized by translators. Availability of equipment and cost of these services may limit use for the time being but as the number of online sources directed at translators increases, as I am sure it will, it will become increasingly cost-effective to go online.

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Terminological Data Banks: a model for a British Linguistic Data Bank (LDB)

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A description of a model linguistic data bank (LDB) for a British market will be given, based on the results of a continuing feasibility study. A LDB represents an economical and highly efficient way of organizing Britain's efforts in the field of terminology, both with respect to English and the many foreign languages through which contact is maintained with non-English speaking countries. The institutional and organizational structure will be outlined. Emphasis will be placed on services to be provided to various groups, and in particular to translators, and on the important role these groups will play in assuring the continued viability and relevance of the LDB, not only as users, but as contributors and advisers. Data acquisition policy and financial aspects will be considered.

A multilingual, multidisciplinary British LDB will provide translators with a valuable service, whose applications are many, whose products are varied to cater for a wide range of needs, whose terminology is continually revised and updated and whose modes of consultation are several.

THIS PAPER IS based on results obtained from a continuing feasibility study of the establishment of a terminological data bank in the United Kingdom, a study being carried out at UMIST under the auspices of the British Library.

I shall use the term Linguistic Data Bank (or LDB) in preference to Terminological Data Bank, as many of the banks we investigated in the course of this study do not restrict themselves to handling terminological data alone. Thus LDB represents a more accurate designation of the types of information systems we will be discussing.

I shall concentrate primarily on work being done in this country towards the establishment of a British LDB, but shall make reference to other LDBs abroad by way of exemplification and illustration. Indeed, I would urge you to keep in mind during this talk that, when I describe possible features of a British LDB, these features already exist in other LDBs. I am not describing services or facilities or search methods that could exist. In our proposals for a model of a British LDB, we have translated the assumedly best features of LDBs abroad to the context of a British market. Where Britain may hope to achieve a measure of innovation in LDB operation is in the use of the most up-to-date technology and software, exploiting information networks and the move towards office and home computers, etc, and in reaping the benefits of recent terminological research. There are significant advantages to be gained by being

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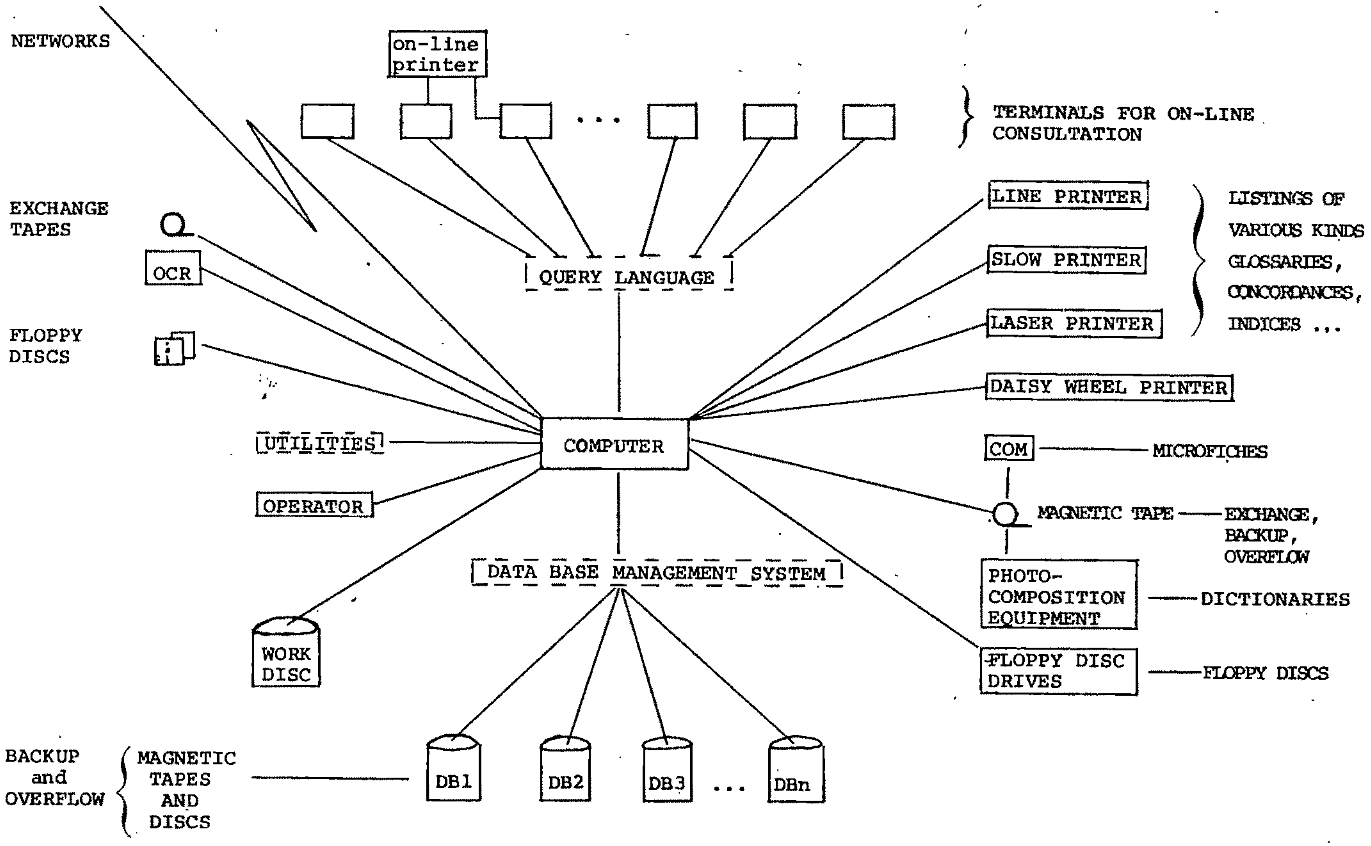

FIG. 1 British LDB Configuration

a late-comer in this field, not the least of which is to be able to study the reaction of users to existing LDBs, and so to be able to design a LDB which will suit users' needs.

There are three sections to this paper: Part I deals with the reasons behind the feasibility study; Part II is a description of the phases of the study; and Part III is a presentation of a model for a British Linguistic Data Bank.

I. Reasons

The reasons and considerations behind the feasibility study are several—I shall mention only the most important:

Special language communication. This involves the constant creation of terms to designate concepts, objects, measurements, products, etc. These designations (terms) differ from the words of general language, in that they refer more specifically than words, in that they are mainly used by specialists, in that they are often created according to established patterns and precedents, in that they are susceptible to standardization and in that they may be relatively short-lived and changed in the light of discoveries and developments.

Efficient communication. This depends on common agreement, and can only be achieved by widespread knowledge of terms (in our case) or by easy access to terminological information. The problems of efficient communication apply with even greater force across language boundaries.

Efficient special language communication. There are many different groups involved in the use and creation of terminology; all groups must have access to terminologies, both their own, and those of other disciplines.

'Information explosion'. The immense upsurge in technological innovation and the concomitant upsurge in new terminology, together with the great increase in multilingual communication needs, means that the work of collecting, storing, sorting and disseminating terminology cannot be carried out efficiently by dispersed methods, especially when contact must be maintained with LDBs abroad housing foreign language data.

Lack of single authoritative organization in the UK. There is no single organization in the UK able to provide authoritative guidance on English usage of specialized terminology. Note that I do not say standardized terminology: the BSI do a laudable job in this area. Specialized terminology, however, is another matter, in that both standardized and non-standardized terms are present. One is dealing with the special languages of different disciplines, with the grey areas where the terminologies of disciplines meet, with in-house usage vis-a-vis wider usage, etc. There is no national centre for terminology, no centre which has close links with other bodies concerned with the production and regularization of usage of specialized terminology. There is also a distinct lack of links with foreign LDBs—no central body capable of negotiating the exchange of data with a foreign LDB, for example.

Existence of other LDBs. In recent years, major industrial countries and international organizations have established LDBs. LDBs in multilingual form exist in (nos. of main LDBs in brackets) Canada (2), at the Commission of the European Communities, in France (1), the Federal Republic of Germany (4), the German Democratic Republic

(1), Sweden (1) and the USSR (2). In Denmark, plans are well advanced for the establishment of DANTERM. The UN plans to establish its own LDB, as does UNI, the Italian Standards Institution. In Spain, HISPANOTERM is of recent creation. Further information on these LDBs may be gained from Sager & McNaught[1]. Great Britain is the only major industrial nation without such a service facility, that is, a centre for the processing of all kinds of terminological data.

There is a substantial amount of work being done in Britain, however, related to thesauri for indexing and retrieval purposes. One of the most important contributions Britain has made in this field is towards the development of the ISONET thesaurus, which is a computerized, controlled vocabulary of some 11.5 thousand descriptors and 5.5 thousand non-descriptors used for the selection of descriptors for indexing and searching standards and technical regulations on ISONET databases. The thesaurus consists of a classified subject display and an alphabetical list (the index to the display) and, though developed at the moment only as a bilingual English-French version, is designed to be both multilingual as well as multidisciplinary. The BSI team responsible for the development of the English part of the thesaurus has helped to produce not only an excellent indexing and information retrieval tool, but also a database whose contents contain a valuable store of terminological information.

English terminology. All the foreign LDBs mentioned contain, or will contain, substantial amounts of English terminology, at least as translation equivalents, and such vocabulary may be misleading. The impact of LDBs on the usage of English terminology outside the UK will increase, and may, without British involvement, introduce usage unacceptable or even incomprehensible to this country.

There is a serious danger that the international role of English as a means of communication may be impaired if a single, national British centre for terminology does not exist. Moreover, as many languages create new terms on the basis of English, uncontrolled elaboration of English terminology in a number of different centres has far-researching consequences for effective communication in other languages and between these languages and English.

Nairobi Recommendation of UNESCO. Paragraph 12 of this document, on the legal protection of translators and translations, reads:

'12. Member states should consider organizing terminology centres which might be encouraged to undertake the following activities:

(a) communicating to translators current information concerning terminology required by them in the general course of their work;

(b) collaborating closely with terminology centres and developing the internationalization of scientific and technical terminology so as to facilitate the task of translators.'

Aslib 1978 conference on 'Translating and the Computer'. The audience of this conference expressed a strong interest in LDBs, and many of the organizations we have contacted during the course of this study were represented at this conference.

II. Phases of the Feasibility Study

On the basis of the above reasons and considerations, the project seeks to establish the following:

In phase one:

- — the use made of LDBs in other countries
- — the cost and financing of other LDBs
- — the institutional and organizational framework of other LDBs
- — the availability and quality of data for a British LDB

In phase two:

- — the possible uses of a LDB in the UK
- — the possible structure of a British LDB

The study itself was split into three phases:

Phase One: LDBs and data

1. The state of LDBs
1.1. Information gathering
1.1.1. Scrutiny of available documentation
1.1.2. Formulation of further enquiries to be made
1.1.3. Follow up enquiries by questionnaire or visits to selected LDBs
1.2. Report on selected LDBs:
their use, cost, financing, organization and institutional framework

Phase Two: Preliminary enquiry among potential users

1. Preliminary technical specification of a British LDB
   - — scope of holdings, acquisition policy
   - — format of holdings
   - — modes of operation, user facilities
   - — maintenance and development
2. Discussion of this model with potential contributors and users
   - — government departments
   - — relevant institutions
   - — industry
   - — translators
   - — information and documentation centres
   - — publishers
3. Evaluation of responses

Phase Three: Feasibility report on a model of a LDB

1. Modification of the technical specification
2. Organizational specification
3. Recommendations

Phase One, the material for which was gathered with the aid of a British Library Overseas Study Visit Grant, was concluded in June with a report entitled 'Survey of Five Linguistic Data Banks'[2]. Some of the main points and conclusions of this report are detailed below:

Three main types of LDB exist:

(a) those conceived primarily as translation aids, including EURODICAUTOM (CEC) and LEXIS (Bundessprachenamt)

(b) those used primarily as language planning aids, for example BTQ (Bánque de Terminologie du Québec) and TERMIUM (University of Montreal)
(c) those used as aids to standardization, including NORMATERM (Association Française de Normalization), TEAM (Siemens ag) in collaboration with DIN (Deutsches Institut für Normung), which now has its own LDB and document retrieval system (DITR) and TERMDOK (Tekniska nomenklaturcentralen), Stockholm, which collaborates very closely with SIS, the Swedish Standards Institution.

Two main methodological approaches to LDB data organization exist, exemplified by EURODICAUTOM on the one hand, which stores keywords and their contexts, in the belief that translators are best served by supplying them with terms in context, and LEXIS on the other, which records terms in isolation, preferring to work from concepts.

The facilities, services, institutional and organizational structure of these major European banks were investigated, as was the functioning of other major LDBs in Europe and elsewhere, through consultation of the literature and via correspondence.

Of great interest to us were the various systems used by LDBs to finance their operations, and to establish links with their users. Here we investigated the partnership systems set up by TEAM and TERMDOK, where partners contribute terminology in return for services, and subscriber systems such as the one operated by NORMATERM. Links with users, and methods of elaborating terminology, were studied especially in relation to TEAM, TERMDOK and DANTERM. This latter has a policy of sending terminologists into the field to develop and research terminology on the spot. TERMDOK has a smoothly-running system of committees which elaborate new terminology in conjunction with industry, etc, and has wide user links in many sectors. TEAM provides a good example of how a partnership system may operate to the benefit of all members. This particular partnership system unites many different groups and organizations, both in West Germany and in other countries, eg Philips, and the Dutch Foreign Ministry. These groups all contribute terminology to TEAM and have access to all TEAM terminology free of charge, payment only being asked for actual processing time.

In the light of the above-mentioned reasons and considerations, and given the interest manifested by many different types of user, the preliminary proposal for a British LDB is not for a LDB conceived primarily for translators, or standardization specialists, but for a LDB that will serve a wide range of users, and provide a wide range of services. This proposal is also based on the analysis of results from Phase I, where a trend was perceived among well-established banks to move towards providing a wider variety of services to a wider number of user groups: TERMDOK, for example, has recently converted to a large multi-user online system, in order to serve an ever widening range of users; EURODICAUTOM, now available on EURONET-DIANE, is now expanding to meet varied demands. TEAM system was among the first to realize the need for and benefit to be gained from serving different types of user, and the success of this system, with its many partners active in contributing terminology in many fields, and its diversified services, catering for translators, publishers, standardization specialists, information scientists and language teachers, has been a great inspiration to us.

There is a concomitant trend for proposed or newly-created LDBs to emphasize multifunctional and multidisciplinary aspects, eg DANTERM, which intends serving translators, technical writers, standardization specialists, publishers, students and teachers of Danish Schools of Economics, and other institutes of higher learning.

III. The model

We have thus proposed that a British LDB be established with the following characteristics:

- multifunctional
- multilingual
- multidisciplinary
- widely accessible

The advantages of such a LDB are:

- increased reliability and accuracy of data
- production at little cost of a great variety of up-to-date glossaries and dictionaries
- direct consultation on/off-line by organizations and individuals
- agreement can be reached and maintained between English usage of terminology at home and abroad
- a greater inflow of literature in foreign languages will be generated, which in turn will generate more demand for translations
- increased and more effective communication with foreign countries, with direct benefits for exporting, especially.

It would seem, on the face of it, that these characteristics and advantages are viewed wholly from an organizational point of view. However, every effort has been made to ensure user orientation of the LDB remains paramount. Without users taking an interest in the creation, development and running of services, an LDB will be a white elephant. Users are the life-blood of a LDB, not just in the role of end-users, but in the role of contributors and advisers. Wide user involvement will ensure that terminology is acquired, elaborated and disseminated in fields and in languages of immediate relevance to users, that services provided will be relevant to user's needs, and, with online searching and input, be as 'user friendly' as possible, and that appropriate measures may be taken to take into account origin of data, conditions of use, and copyright.

During the second phase of our study, then, we concentrated on the needs and expectations of users. We approached those people who would be likely to use a LDB (ie the staff translator as opposed to the company chairman), and supplied them with documentation on existing LDBs and preliminary specifications of a British LDB for discussion purposes. We then sent them a detailed questionnaire. Follow-up enquiries were then made, as many as time and manpower resources would permit.

Results enabled us to construct typical 'user profiles': type of work carried out, the manner in which people worked, the subject areas covered, the search and output facilities desired, etc.

Comments were also obtained on the organizational and institutional structure of a LDB, on how a LDB should be financed, on which areas of terminology should receive prime attention, on which languages should be developed, on exactly what information different users expected to obtain.

Our final report to the British Library will therefore express the wishes of potential users. LNB data acquisition policy and services should be guided by those who will use the LDB, not imposed from above.

Uses

In order to cater for numerous different user groups, uses and services of the proposed LDB should be several and varied. The main aim is to provide complete flexibility of search and output facilities. It is proposed that users should not receive exhaustive information on a term, as normally they work at any one time with subsets of term record fields. Study of user profiles reveals that certain user groups prefer to work with certain fields. Thus it is proposed that pre-specified 'packages' be offered eg term + translation equivalent + source, or term + definition, or term + translation equivalent + context, and so on. We are grateful to Mr Arthern for advice regarding such packages[3]. Also, we propose that users should be able to define their own search and output facilities from among those available, thus a request from user X would produce by default output in the format he has previously specified, information which the computer can gain through for example inspection of formats associated with user identification codes.

When working conversationally, output can be given in graduated form, a refinement of the 'package' technique. That is, one may be interested in receiving primarily term + translation equivalent. In many cases, this information may be enough for one's particular purpose. However, in case of doubt, one should be able to receive further information, simply by pressing a button, eg source + context. Which information, how much and in which order, are choices that should be left to the user.

Search operations so far defined are:

(1) single term search ie a defined sequence of characters (this could be a uniterm or a multiterm)
(2) arbitrary string search eg one may wish to output all terms beginning with, or containing, a certain sequence, for example, 'ethyl' or 'inter'.
(3) abbreviation
(4) list of terms, where information common to all terms in the list is required, eg one may wish to see whether a list of terms have the same source, or perhaps the same synonyms.

Numbers 1 and 3 involve searches of specific fields, whereas numbers 2 and 4 involve general field searches. These may be undertaken in either online or offline mode.

Online conversational mode should also allow:

(1) paging in the alphabetic order of the source or target language (paging is equivalent to browsing through the data base)
(2) paging in the systematic order of the source or target language
(3) paging through successive multiterms beginning with or containing the query term.

The above search operations can be made more sophisticated using 'intelligent' search techniques eg if a uniterm exists as part of a multiterm only, then the computer should be able to find it. If no match is found, interaction with the user may take place eg the computer may prompt the user to supply a synonym, and then carry on the search with this new information. Manual or automatic morphological truncation of terms will also prove useful, in case, for example, a term is input in the plural form, when the stored term exists in the singular. The major aim of introducing 'intelligent' searching is to ensure that the computer carries out an exhaustive search, and that even when this fails, it is able to be as helpful as possible, by offering related and relevant information.

Output Formats

Given that output formats are dependent on the needs of individual users, it is proposed that fully parameterized output options be offered. That is, users should be able to choose not only which information they want, and in which form, but also such details as eg page coverage, line spacing, number of columns, character set, type of 'package', and so on. As operations on an open set of options are involved, only a few possibilities are mentioned:

Two basic types of information are usually required by users:

(1) a complete term record, or selected fields thereof, perhaps 'packages'; (this is typically for online use)

(2) selected fields of more than one term record, output in the form of, for example:

monolingual alphabetic indices	egs	term + generic term
bilingual indices		term + synonym + translation equivalent
text-oriented glossaries		term + synonym + source + translation equivalent
alphabetic/systematic glossaries		(many other combinations possible)
by subject area(s)		
by language(s)		
by project(s)		
by source(s)		
etc.		
phraseological glossaries		
concordances		
keyword indices		
full-scale dictionaries		
etc.		

Output Media

In order to provide a wide range of services to a wide range of users, the following output media are necessary:

—— VDU or visual display unit. This has the advantage of offering great versatility. For example, one may receive anything from screenfuls of information to single lines. Screen 'windows' may be employed. A translator could have one section of his VDU screen reserved as a working space, another for calling up information from the LDB. Various types of terminal exist, such as 'slave' terminals, which are directly connected, and have no processing capability of their own, or 'intelligent' terminals, which, as the name suggests, have a certain amount of individual processing power. One may of course wish to connect one's own office or home computer to the LDB, via a telephone link. It would also be possible to work totally independent of the LDB (see below), using one's own computer.

—Hard copy. A variety of printers should be available, to provide various degrees of quality output, which could be supplied on various types of paper. A user should also be able to receive information on his own printer. Updated printouts of eg glossaries could be sent on a regular basis.
—Microfiche. Advantages here are low cost and regular updates. Such media are very useful for infrequent but detailed searches. Also, it may be the case that some users may prefer to work with hard copy or microfiches to begin with, especially in the early development years of the LDB, and only acquire conversational capability at a time when the LDB can supply a useful number of responses in relevant subject fields.
—Magnetic tape. Such a medium may be useful for eg publishers, who wish to submit many thousand terms for processing. Tapes will also be used for exchange purposes with other LDBs and terminology centres.
—Floppy discs. Subsets of the LDB could be recorded on floppy discs, for use in the user's own computer system. This allows the user to work independently of any link to the LDB. The advantages here are again low cost and the possibility of regular updates.

The accompanying figure shows a possible configuration of a British LDB. (Notes: DB=database; OCR=optical character recognition device; COM=computer output microfilm).

Advantages of using a LDB

We have already mentioned several advantages of a LDB in passing. Here I would just like to draw your attention to the advantage of using a LDB over looking in a dictionary, or consulting a subject specialist, two of the most widely used methods of solving a terminological problem.

With a dictionary, you may find that even a recently published edition may be out-of-date. Consulting a subject specialist may be fruitless, as he himself may not be aware of the term.

A dictionary is time-consuming to use (especially if you share one, and someone else is using it) and consultation may likewise be time-consuming (especially if your specialist has gone for coffee, or you enter into a conversation).

With a dictionary, you must know how it is organized, in order to be able to use it efficiently. Consultation may involve lengthy explanation of the context, or description of the conceptual environment of the term.

When searching in a dictionary, one is usually confined to a 'main entry' type of search. Also, the dictionary, being printed on paper, is of fixed format, and so may not be suited to your especial needs. Other disadvantages of a dictionary are that it is bulky, prone to wear and tear, and not particularly cheap. Failure to find a translation equivalent for a term, for example, whether as a result of dictionary look-up, or of consultation, may encourage creation of a neologism, which in many cases may hamper communication, rather than aid it.

When one looks at a LDB, however, the following advantages are immediately apparent to the professional linguist. The LDB's terminological data are up-dated constantly, with new terms being inserted, obsolete terms excised, and new information being inserted on existing terminology. Access to the LDB can be very rapid, if working on-line, or with one's own subset of the LDB on floppy disc, or with a microfiche or printout tailored to one's needs. The LDB can be considered as a 'black box': the user does not need to know how the data are organized inside the machine. He is helped in his search by powerful search routines, whose existence he is again unaware of, as his contact with the LDB is through a query language which is constructed so as to be as 'user friendly' as possible, and may in fact represent a restricted subset of his own language. These powerful search routines mentioned ensure that a search is as exhaustive as possible. The computer can carry out parallel searches in a number of different data bases, in a number of different term records, and so on, comparing, correlating, combining information in order to produce not just a correct response, but, in the case where a primary search proves negative, a response that may go some way to providing the user with at least some information regarding his query. Exhaustivity and reliability, combined with the authority of a well-run and widely respected institution, will ensure that the LDB offers practical and useful services to all its users.

Costs to user

At this stage, no decisions can be taken regarding costs to the user. However, analysis of practices in other LDBs suggests several methods of payment for services. It is to be hoped that a British LDB will offer a combination of these, suited to individual users' needs. Methods employed in other LDBs are:

Sponsorship system. This would involve an annual grant in return for free use of the LDB, a system practised by NORMATERM.

Subscriber system. This would involve for example a monthly sum giving credit at special rates, again a system used by NORMATERM.

Ad hoc system. This involves payment on a time or unit basis, and is a method practised by all LDBs.

Contributor system. Supplying data free of charge against payment or in return for services is a system offered by eg TEAM.

Partnership system. This would involve supplying data in return for credit to use the LDB, and is a system practised by TEAM and TERMDOK, with a great deal of success.

Conclusion

Most of the services of the LDB would be non-competitive, as they would not be available in any other way. On the other hand, users will consider paying for these services only if they lead to a reduction in their own costs, if they represent a necessary improvement in the quality of their work, ultimately reflected in greater income to justify this expenditure, or if they contribute in some other way to increased productivity, new products or services. If for example the job-satisfaction and productivity of translators can be increased by, say, 10%, the translator, or his employer, may feel justified in spending an equivalent amount on LDB services. However one looks at it, it would appear to be the case that the demand for translation, and thus for the services of the LDB, will be increased, due to the existence of the LDB.

I stress that what has been presented here is one of several possible models for a British LDB. However, we believe that this particular model is best suited for a British market. This conclusion has been reached due to wide consultation of potential users and contributors. Whether a British LDB is eventually set up or not, is not a decision that we who carried out this feasibility study are empowered to take. What may definitely be said at this stage, is that a large body of interest exists, that this interest is manifested in many different sectors, and it is this interest which will proclaim not only that a British LDB could exist, but also that it should exist; not only that it could be used and supported, but also that it will be used and supported, for the design that has been presented to you this afternoon has been based first and foremost on the needs and expectations of the person who will benefit most from it: the user.

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Aids unlimited: the scope for machine aids in a large organization

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This paper examines the types of machine aid which are suitable for use in a large translating operation such as those met in the European Community institutions. After reviewing the way in which these machine aids are already being used in large organizations, and examining the areas in which they can be of benefit to the running of the whole organization, the speaker warns of possible difficulties in introducing them.

If these difficulties can be overcome, many advantages can be gained in a large organization by introducing a fully-integrated word-processing system in which all texts are stored in electronic archives and can be transmitted electronically from one work station to another, and from one country to another. The principles on which such a system could be developed can also be of immediate practical interest to the small user.

THE INFERENCE OF the title of my paper seems to be that large organizations have unlimited money to throw around, and can therefore afford to install unlimited machine aids for their translators, perhaps even going as far as replacing them by a high quality fully automatic machine translation system; and certainly going beyond what a 'small user' can permit himself.

The reality is quite different, at least as far as the European Community institutions are concerned, since the harsh winds of the economic recession are now blowing across Europe, and the national Treasuries are sending their axe-men to Brussels to cut the Communities' budget to the bone. For example, at the Council Secretariat we discovered with some consternation recently that our 1981 draft budget for word-processing equipment will not allow us to continue renting the limited amount of it which we already have, just at the moment when there are signs of a dawning acceptance of what word processing can do for us.

Large organizations in which the battle-cry is going to be that of saving money are, in the nature of things, going to have very little scope for introducing machine aids for their translators unless someone or some group in the organization stands up and fights for them.

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The real progress now being made in introducing machine aids for translators is in areas where the object is to make money, not to save it, i.e. in large go-ahead commercial translation agencies, in two or three of the big computer companies, and in operations such as the Systran and Weidner machine (-assisted) translation systems which are being aggressively marketed.

However that may be, I propose to follow the precedent which earlier speakers have set, of talking about a particular operation of which they have practical experience, rather than addressing themselves to a wider, more theoretical, attack on their subject.

Accordingly, I want to describe the scope for the use of machine aids in the Secretariat of the Council of the European Communities, as I see it. As I go along, I shall be mentioning some aspects of the various types of machine aids which are available or under development. I shall also refer to the use already being made of machine aids in other organizations, and to the difficulties people have encountered in introducing them and using them.

The first step in deciding what can be done about a given situation is to discover what the situation is, so I will start by describing the way in which the Council Secretariat operates, and where the Translation Department fits in.

The Secretariat exists principally to service meetings of the Council of the European Communities, the Permanent Representatives Committee, and all the many working parties involved in preparing the proposals for Community legislation which are put to the Council in the form of Regulations, Decisions and Directives. These proposals all originate in the Commission, which sends them to the Council in all six Community languages—seven after 1 January 1981, when Greece accedes to the Communities. Very urgent proposals may go straight to a meeting of the Council, and may even be translated in the Council Secretariat, but the general principle is that a proposal does not even start its journey through the Council's working parties until it has been received from the Commission in all the official languages.

Such non-urgent proposals start their progress through the Council Secretariat by going to a working party of national experts who subject them to minute scrutiny, not simply to protect national interests, but in a genuine effort to discover any difficulties there could be in applying the legislation, and to produce legal texts which will hold water, and can be effectively applied in all the Member States, with their widely differing legal systems.

When most of the problems have been resolved, a proposal goes to the Permanent Representatives Committee, consisting of the Member States' Permanent Representatives in Brussels (they rank as Ambassadors), who meet each week and who iron out as many of the remaining difficulties as they can before sending the proposals to the Council, either for approval on the nod, or for political discussion.

Once agreed by the Council, in principle, the texts in the various official languages are vetted by a 'Jurist/Linguist's Working Party' whose job it is to ensure complete concordance between the texts in the various languages before they are published in the separate language editions of the *Official Journal*. It is worth noting here that there are not separate national editions: the French edition, for example, is valid in France, Belgium and Luxembourg, the Dutch edition in Belgium and the Netherlands, and the English edition in Ireland as well as in the United Kingdom.

It has always been the practice in the Council Secretariat for the most important working language to be French. Consequently, as a proposal moves through the working parties and then the Permanent Representatives Committee it is repeatedly amended, and the administrators who act as secretaries for all the meetings produce an amended text of the proposal after each meeting, together with the minutes of the meeting, both documents normally being drafted in French.

These French texts are then translated in the Translation Department into all the other official languages and distributed to the national officials for their use at the next meeting or, at the last stage, are submitted to the Council for formal adoption and publication in the *Official Journal.*

It will be obvious from this brief outline of how the Secretariat operates that there would be tremendous advantages in using word-processors for typing the repeatedly-amended French texts of proposals for legislation, quite apart from their possible use in the Translation Department. As a matter of fact, one Directorate in the Secretariat is now using a word processor for this purpose, with encouraging results so far.

Having sketched the background to our work, we can now look more closely at how the Translation Department operates. This Department now consists of seven Divisions, since we have recently welcomed our first Greek colleagues who form the nucleus of the Greek Division which will be required to translate Council texts into Greek as from 1 January next year. The other language Divisions are French, German, Dutch, Italian, Danish and English, the latter being my own Division. For the record, we also have a capacity to translate documents into Irish, but this is a limited operation. French being the language in which most Secretariat documents originate, the French Division's work is quite different from that of the other Divisions, consisting largely of translating documents received in their own language from the various national Permanent Representations.

What I am going to say now, therefore, applies to the German, Dutch, Danish, Italian and Greek Divisions, in the same way as to the English Division, since we are all basically translating in parallel from French originals. We do translate texts from other languages now and again, but the proportion is so small that it hardly affects the argument which I am going to develop. For example, in the first three months of this year texts translated from German into English amounted to 1.6 per cent of the English Division's output, from Italian 1.4 per cent, from Dutch 0.4 per cent and from Danish 0.2 per cent.

The typical Division, then, consists of some 45 to 50 linguists of whom about one-third are revisers and two-thirds are translators, with two or three archivists and two or three secretaries who book work into the Division, distribute it to the translators and revisers, and see that the finished translations are sent on to the Typing Pool by the stated deadlines.

Present arrangements are that translators can type their own work, can use dictating machines, or can call on typists to whom they dictate their translations on the typewriter in their office. In principle, all translations are revised by a reviser before being sent to the Typing Pool, who are entirely responsible for the accuracy and presentation of their typing. Some documents are typed on stencils, for reproduction on duplicating machines and some on plain white paper to produce originals for off-set printing.

Now, where do machine aids fit into this picture?

Of course, when we talk about machine aids the implicit assumption is that we mean computers or word processors (and the boundary between these is getting hazier every day), but the first machine aid, introduced about 100 years ago, was of course the typewriter, which has developed in the past 20 years, via the magnetic-card typewriter, into today's word processor.

Another very important machine aid has been the dictating machine. We were using dictating machines in my first translating job twenty years ago and like many of us I used to use a tape recorder with foot control for doing freelance work in the evening. Given an accurate and fast typing service, dictating machines continue to be one of the most valuable aids for fast and accurate translation.

Another machine aid which we use extensively in the Council is the photo-copier. Some 45 per cent of the pages leaving my Division and all the other language divisions at the Council, except the French Division, are existing texts which have been amended to some extent, such as the substantive text of a proposal for a Council Regulation, which has been discussed and amended in a working party. Many of our translations therefore consist of what we call 'cut and stick' work in which the translator himself takes a photocopy of the earlier document, cuts out the appropriate passages and amends them by hand, filling in between with new translation. An activity survey carried out in the Division some years ago showed that translators spent 3 per cent of their effective working time in obtaining documents from the archives, 1.8 per cent in getting photocopies and 7.8 per cent in 'cutting and sticking' documents.

We also have a large number of standard texts such as letters accrediting ambassadors, letters to the President of the European Parliament, letters appointing members of committees, of which we have photocopies and simply insert names and dates etc. to produce the text which goes to the Typing Pool.

It is obvious that all these types of work can be handled on word processors, so we might say that for our purposes the first use of the word processor will effectively be as a combination of the typewriter and the photocopy machine. I will return to this later.

A further aid not to be despised is microfilm, or microfiche. I myself have no direct experience of using this in the Council, although one Division has access to the European Communities' *Official Journal* on microfiche. I also understand that the Translation Service at the Department of Industry and Trade in London takes the French and English versions of the *Official Journal* on microfiche and have been experimenting with using microfiche instead of hard copy. Their experience may be useful, in that they found that, when they were confronted with draft amendments in French to European Community Regulations, they needed to look at the original French plus the original English, note the differences in the French and produce a new English version. Two microfiche readers were therefore set up side by side so that it was possible to compare texts.

The intention, I understand, is now to use a reader-printer so that a translator can locate the relevant fiche, obtain a quick paper copy of the new pages he needs and then work at his desk. This will also have the effect of enabling 2 translators to work on the same job if urgency requires it.

Returning to the Council Secretariat, the first use of electronic machine aids for translators has been in making terminology available to them. It is quite obvious that with nearly fifty people producing translations into English of texts which keep coming back again and again—and, because of the pressure of deadlines, with no possibility of ensuring that documents on a given subject always go to the same person or group of people—it is absolutely essential that our terminology is placed on record as fast as new terms are met, and is made available to all linguists as soon as possible.

My eyes were opened to these problems as soon as I joined the staff of the Council of the European Communities in 1962, as a translator on the first abortive negotiations for Britain's accession to the Communities. I continued my previous practice of noting the English equivalent of all the terms and expressions which caused any difficulty and this came in useful when I was subsequently appointed as reviser in charge of the small team of translators. In order to avoid two or more people wasting their time on finding their own answers to one and the same problem, I used to circulate lists of terms taken from my own notes and short typewritten text-related glossaries.

When the negotiations collapsed early in 1963 I decided then and there that the computer was going to be the answer to the problem of attaining consistency of usage in any large-scale translation operation.

There was now a need for English translations, even though the United Kingdom had not become a Member of the European Communities, but I was not in any position at the time to ask for a computer in order to put my principle of 'once is enough' into practice so I had to make do with file cards. These personal file cards, kept up through seven years of waiting until successful negotiations were started in 1970, became the raw material for the first edition of the French-English *European Communities Glossary*. All the subsequent editions of our glossary, including the current, seventh, edition, were produced by retyping the whole text each time, but with the seventh edition we entered the electronic age.

Some 18 months ago the Council Secretariat finally took the step of setting up a Terminology Service, on rather unusual lines in that the terminologists were part-time volunteers who manned separate terminology bureaux in each of the language Divisions, but with a Central Secretariat which has been equipped from the beginning with word processing machines and staffed by multi-lingual secretaries capable, between them, of typing quickly and accurately in all the Community languages.

The seventh edition of our French-English Glossary was the first job to be done on the word processor, an IBM machine with an ink-jet printer. The fact that all the 1,000 pages were on floppy discs greatly simplified correcting the mistakes discovered in reading the proofs and the secretaries also found the word processor physically easier to operate than the electric typewriters they had been using previously. Since we had regarded the whole operation as experimental, however, we changed some nine months ago to the Siemens equipment which we are now using. We have produced one supplement to the Glossary on the Siemens equipment, and are about to produce a second, cumulative, supplement, for which purpose it will only be necessary to type in the new terms. As these new terms are inserted in their correct alphabetical position, all the terms beyond move down, and the system re-paginates the supplement automatically.

We do have a problem, in that the Siemens equipment cannot read the complete Glossary which was recorded on IBM discs, so we need to get a conversion programme set up in order to enable us to produce the next edition of the complete Glossary by slotting the final cumulative supplement into the seventh edition, without retyping it.

At present, then, we are using our word-processors to produce a traditional printed glossary, but we designed the layout of the glossary pages so they could easily be consulted on a visual display unit. Since the current equipment only operates with one floppy disc at a time, and we have at least one for each letter of the alphabet, it is not possible to interrogate the word processor for terms which are not on the disc which happens to be in the machine. Also, when one keys in a query the required term only comes up on the screen very slowly, as the equipment has to read each page, starting from the beginning of the disc.

However, when more sophisticated word processors become available, with a much greater memory capacity, we hope to be able to expand our present bilingual system into a multi-lingual terminology system which can be consulted on word processing terminals placed in each translators' office.

The first principle which we have adopted in our terminology operation in the Council Secretariat is to keep the actual terminology searching and recording inside the various language Divisions, and to have our terminologists continue to translate or revise for part of the time.

The second principle is that each Division prepares its own bilingual files of translations from the language or languages which are important for it. For example, all Divisions except the French Division are concentrating at first on building up files of terms found in their own language when translating from French. These files will be printed as separate versions of the Council's *European Communities Glossary* in due course. The French Division has already produced an English-French Glossary which is now being printed, but which will not be available for sale at this stage, and our Terminology Service has distributed within the Community institutions, also under the *European Communities Glossary* title, a French-German Glossary produced by the Head of the German Translation Division at the Economic and Social Committee. It is interesting that this has almost the same layout as our own glossary.

In producing the bilingual card files in our separate Divisions, on which our glossaries are based, we exchange cards with other Divisions. At first we did this by means of special multiple cards which gave a messy carbon copy, but now we have managed to programme the Siemens word-processor to print cards in any combination of two languages, with either language at the top.

As an exception to our general approach of working with two languages at a time, our French Division are now scanning Community documents in French, German and English and producing lists of terms in three languages. These are being typed onto a six-language mask on the word processor, and when these terms have been typed once, we can produce bilingual cards in any combination of the three languages, and also bilingual glossaries, without further typing.

As I have already hinted, we hope this way to build up a multilingual terminology system which can print out up-to-date bilingual Glossaries at the touch of a button and can also be consulted via the screen on the word processor in each translator's office.

The production of a multi-lingual terminology system in this way, built up basically from bilingual terminology units, presupposes that there is an exact match of meaning in the various languages. We all know that this is very often not the case in our day-to-day linguistic experience. Terms in two different languages which do have the same meaning in one context very often have other areas or shades of meaning which do not coincide. However, within the European Communities, and certainly in legislative and legal texts within the Communities, there must of necessity be exact equivalence for a given concept across all the languages.

When this realization is combined with the situation which we have in the Council Secretariat, i.e. that at least 95 per cent of the texts in the various languages originate from a common language—French—we do have the possibility of automatically producing a multi-lingual terminology system from separate discrete bilingual files all based on French as pivot language, provided three conditions are met when recording individual terminology units. These are:

(1) The form of the French expression must be identical in all the bilingual units. Otherwise, a computer or word processor will not recognize the units as being equivalent.
(2) The concept expressed by the French term must be exactly the same in all the language combinations.
(3) The context of the concept must be identical for all the language combinations. For example there may be a concept which is identical in two contexts, but the actual terms used in any given language may not be identical. For example, the French term 'techniques d'abattage' is 'coal-getting techniques' in coal-mining, but 'stoping techniques' in metal-ore mining.

The French-English version of our *European Communities Glossary* is, incidentally, on sale at Her Majesty's Stationery Office and some booksellers, price £7.60. The cumulative supplements are not put on the market, but are distributed only within the Community institutions and to Government Departments, University Language Courses, and European Community Depositary Libraries. When it becomes possible to interrogate data bases via the Prestel system in the United Kingdom we will consider making the Glossary available on this service.

In addition to our own terminology system, the Council Secretariat also has a computer terminal in our central Terminology Secretariat which is permanently connected to the Commission's computerized terminology database, 'Eurodicautom'. This system is also multi-lingual; it was originally designed on rather different lines from our own Glossary, which means that it tended to overwhelm the user with superfluous information. The latest software, which is not yet available on the terminal in the Exhibition, does go a long way to giving the 'translator's package' of basic information, for which I have been pleading for some years, so perhaps the various systems are converging towards a basic common denominator of what the translator really needs.

With the proliferation of word processors making it possible for anyone who has the necessary money to set up his own 'computerized' terminology data base, the dream of exchanging terms automatically between one term bank and another is fast becoming unachievable, unless someone can produce a standard layout and standard technology very quickly indeed.

Although term banks were with us some time before sophisticated word processors became generally available, and had already become an absolutely indispensable factor in the operation of some large translation organizations, such as the Bundessprachenamt in West Germany, it is the advent of the word processor which is going to affect all translators radically in the very near future.

In fact, if the necessary funds can be found, our next step in the Council Secretariat will be trials with a word processor in my own Division to see what advantages it can offer in producing the final typed texts of translations, and also to discover any disadvantages as compared with our current methods of working. I envisage setting up a small team of volunteer translators, revisers and secretaries, to experiment with various ways of using the equipment. At first, we will produce translations on the word processor in parallel with translating the same texts elsewhere in the Division, so that if anything goes wrong, translations are not held up. This is a vital consideration in attempting to introduce new equipment. As the bugs are ironed out, the new system can gradually replace the old methods, and be extended to cover new areas, if it does really prove to have advantages and to be cost-effective as defined in the particular organization's own terms.

You may be surprised that I have got so far without mentioning machine translation or machine-assisted translation, as it is generally called nowadays. This is partly because the Council Secretariat will certainly never go in for developing its own machine-assisted translation system, and partly because I am trying to proceed logically.

The Commission of the European Communities has in fact done a good deal of work on machine translation under the first action plan for the transfer of information between languages which is sponsored by DG XIII, the Directorate General for the Information Market and Innovation, in Luxembourg, and is continuing its efforts under the second action plan.

Some years ago the Commission bought the use of the American commercial machine-translation system 'Systran' and, together with its originators, did a considerable amount of work on developing its capacity in English-to-French, French-to-English and Italian-to-English translation.

The results have not so far proved adequate for use in the Commission's own Translation Department, largely because too much post-editing (or revision) was required, but the Commission plans to offer a service of Systran translations on demand from databases on the Euronet network. There is also a growing interest in the possibility of using Systran for translating patent specifications.

What did become evident during the Commission's development work was that any operational use of machine translation in Community translating operations would have to take place in the framework of a system employing word processors. So, even although it is not at present envisaged that machine translation can be employed in the Commission's own translation operations, DG XIII are going ahead with the installation of a Wang word processing system linked to the Siemens computer on which Systran is being run, in order to develop such a combined system.

During the development of Systran, the Commission has also sponsored a remarkable breakthrough in machine translation, which was thought to be impossible. Margaret Masterman and Bob Smith of the Cambridge Language Research Unit have succeeded, under a contract given to them by the Commission, in producing a machine-translation programme which is capable of translating Systran's own machine-translation programme into plain English. So far as they know, this has never been done before, but they would be very glad to hear of, or from, anyone who has performed the same feat.

Their success in 'cracking' Systran, with the co-operation, be it said, of Systran's own people, means that for the first time the humble linguist like myself can get some idea of what is going on inside the black box of a machine translation system. Since it has been generally recognized that further significant improvements in the quality of machine translations can only be achieved by putting practising translators to work with the designers and computer programmers this new possibility of enabling a non-computer specialist to understand what a computer is doing, and to learn how to talk back to it, is very exciting indeed.

Having learnt a lot from Systran, the Commission is now sponsoring the development of a purely European machine-translation system, already christened 'Eurotra.' A proposal has been submitted to the Council, which has been asked to vote Community funds to be used alongside funds put up by the Member States in order to support a co-operative research and development programme which should produce usable results in about five years time. In the present axe-wielding climate, it remains to be seen whether the money will be forthcoming.

So, as I hinted earlier, practical results in machine-assisted translation are at present being achieved only by the aggressive marketing policies of Systran—rumour has it that commercial translations based on Systran output will shortly be available in Canada and also in Paris, presumably from English into French in both cases—and now by the more recent appearance of the Weidner system. As you will have seen, the Weidner system offers a fairly basic translation facility on a word processor, but leaves the translator (or reviser) in full command of the operation.

Another system coming onto the market soon is IBM's 'Document translation assistance facility', but this is simply a specially designed word processor, also with a split screen, which enables the whole human translation process, including terminology searching, to be carried out at the terminal. Incidentally, their literature rather lugubriously refers to the translator working in 'terminal sessions', which has unfortunate connotations in English English.

This IBM system, and the systems already installed by one or two large commercial translation agencies, are in fact expressions of the concept of the 'translator's office of tomorrow', which I sketched in my paper in the proceedings of the Aslib Seminar on 'Translating and the Computer' two years ago.

With this concept in mind, i.e. of a complete translating system based on the word processor, let us return once more to the Council Secretariat.

While we are probably not going to be using machine translation, or even machine-assisted translation, in the near future, I certainly expect to be able to achieve great advantages in speed and consistency of translation, if not a reduction in costs, by using word processors such as those demonstrated here.

It has occurred to me however—and I sketched the outlines of this proposal under the acronym 'TERRIER' in my Aslib paper two years ago—that the Council Secretariat, and perhaps other institutions and large organizations, and even 'small users', could gain tremendous advantages from the use of an integrated word processing system which produced translations by 'text-retrieval' rather than by the use of a machine translation programme. Quite simply, this is a further logical extension of the 'once is enough' principle. Now that we have reached the stage of recording the correct equivalents of individual terms, and making them available electronically, so as to achieve consistency of terminology, and now commercial pressures are causing manufacturers to offer us cheaper and cheaper word processors with bigger and bigger memories, why not go the whole hog and store all the translations we have ever done in the word processor's memory?

It must in fact be possible to produce a programme which would enable the word processor to 'remember' whether any part of a new text typed into it had already been translated, and to fetch this part, together with the translation which had already been made, and display it on the screen or print it out, automatically.

In the Council Secretariat, for example, all typewriters could be replaced by work stations with their own word processing capacity, but all connected to a central computer with a very large memory which would store all the texts produced in the Council Secretariat, in all the official languages. Any new text would be typed into a word processing station, and as it was being typed, the system would check this text against the earlier texts stored in its memory, and would locate any part of it which had already been stored in the memory, together with its translation into all the other official languages. The system would also need to locate existing passages which had been amended before being incorporated into the new document.

In this way, the system would produce partial translations of new documents in all the official languages, which could be printed out and given to the various translators for completion. One advantage over machine translation proper would be that all the passages so retrieved would be grammatically correct. In effect, we should be operating an electronic 'cut and stick' process which would, according to my calculations, save at least 15 per cent of the time which translators now employ in effectively producing translations.

When the translations were completed, the texts in all the languages would be typed into the system for printing by whatever means was being employed, and at the same time would be available in the central electronic archives to serve as a basis for the translation of subsequent texts.

Once a text was in the system, it could also be transmitted electronically to word processors in the Member States' capitals, and printed there for local distribution, so as to gain a day in the distribution of documents and avoid the need to physically despatch so many tons of paper each year from Brussels.

Looking even further, it would be possible to service Conferences held in towns away from Brussels by remote translation, originals and translations being rapidly transmitted to and fro via the telephone network, or other data-transmission networks now being developed.

With this development, we shall have come full circle again to the 'small user', because each of the individual translators, revisers or post-editors working on such an integrated network in a large organization will be in exactly the same position as a 'small user'—a lone freelance, or translators in a small commercial or government translation department—who could communicate with other small users and with large organizations, over the public data-transmission network.

All that is required is that each individual translator, either working on his own, or in an organization whether large or small, has a word processor terminal with access to a large enough memory to store all the translations he does, and connected to all other compatible translating terminals by the public data network. Anyone on the network will be able to telephone anyone else and his own word processor will then automatically check whether the text he has been asked to translate already exists in the second word processor's memory. If it does, it can be transmitted to the first word processor almost instantaneously and printed out at once, or used as the basis for further word processing operations. It would also be possible for one word processor to obtain terminology from another word processor's memory in the same way.

It would of course be necessary to set up a system of charges for information supplied in this way, but this should present no problem in this age of electronic accounting. Payments could quite simply be charged to your credit-card account!

To turn this dream into reality, a lot of hard work remains to be done, and it should be done just as quickly as possible if we are to get the manufacturers to understand the problems involved, and to market a 'translator's word processor' which will be as ubiquitous and as compatible as the telephone.

Perhaps there is an opportunity here for the European translating profession to work urgently with manufacturers in order to produce the specifications for a universal text-communicating system, and to place it on the market.

New developments in information technology for interlingual communication

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Paper presented at the Aslib Technical Translation Group conference and exhibition, London 20 November 1980.

INFORMATION TECHNOLOGY IS a new interdisciplinary field combining information science, computing, telecommunications and electronics. As it establishes links across national and linguistic boundaries it also acquires a multilingual dimension requiring translators as links in the interlingual communication process. The translator thus can no longer be considered in isolation; he is simply another mediator, generally between natural languages, similar in function to information scientists who mediate between natural and artificial languages, be they documentation languages or command languages to access databases, and similar also to those computational linguists who mediate between natural languages and computer languages. Interlingual communication is expanding and its means and methods are changing. This is not only reflected in two major Aslib Conferences on this topic in two years, but in Action Plans of the Commission of the EC, the activities of INFOTERM in Vienna, ISO, FID, and UNESCO involvement in this work, the growth of terminological data banks, as well as new organizations and studies in every developed country, some of which were mentioned during this conference.

This concern with interlingual communication is fully justified as with its increased volume new problems arise which require solutions. We all know of the cost of the multilingual regime of the European Community institutions which represents a substantial part of the budget of each organization. Equally the Council of Europe has 800 employees from 21 countries, representing 16 languages. It produces 50,000,000 written and 136,000,000 spoken words every year in any one language. With closer economic cooperation throughout the world and ever more international organizations and meetings the cost of translation and interpreting services may become too heavy a burden to bear unless solutions for reducing costs can be found. With six official languages the EC has to deal with 30 language pairs for translation, ie five translations of each significant document. With the addition of Greek the number of language pairs into and out of which translation will be required automatically rises to 42. At the beginning of this century three languages covered most publications in the field

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of science and technology. A scientist with a reading knowledge of English, French and German had a nearly complete coverage of all scientific publications. While English still is the language of some 50 per cent of all scientific papers the rest is made up of some 50 other languages though admittedly of very uneven importance according to subject fields. In technology English also still has a dominant position but other language communities increasingly feel the need to develop technology in their own languages in order to stimulate home-grown research and development and to facilitate education. We are also witnessing an unprecedented development of national languages in newly independent countries which require written languages for the purpose of national development in all spheres, for some of which they had in the past relied on a European language. This is not only a national problem but requires adjustment by all other countries in regular contact with such linguistic communities who upgrade the status of their own language.

Another factor which increases the importance of interlingual communication is the growing sophistication of the export products of developed countries. In some cases the documentation accompanying a product can represent a major part of the cost and in such cases reliable translations of the full documentation is essential for the customer. Finally, the introduction of networks linking documentation databases across linguistic boundaries makes multilingual data available which, however, can be fully utilized only if translation can be provided with a speed and efficiency comparable to that of accessing the data in the first instance.

This then is the background to what is commonly described as the 'interlingual information explosion' and the various speakers have dealt with different aspects of aids for the translator. Mr Stiegler described the role and function of word processors and also looked at new developments in optical character recognition and voice analysis. It is to be noted that microprocessor applications in the monolingual office are well established. What is new is exploring their optimal use in the various processes that are globally described as 'translating'.

Mr Clark, one of the pioneers in using a word processor as translation aid, presented his own experience in using the new technology for the compilation of glossaries, interactive translation, revision, production of final copy and filing translations. He confirmed the expectations of increased efficiency and productivity achieved by the use of new tools but also pointed out that new techniques and working habits are required to maximize the use of word processors.

Miss Duckitt outlined the possibilities and advantages of online access to documentation databases. She described the services of the International Translation Centre in Delft in the logging of existing translations and how multilingual documentation databases can be used in looking for new translation equivalents. A particular kind of database, automated dictionaries or terminological data banks was described by Mr McNaught who briefly presented the scope and function of existing databases and then sketched out a model for such a new linguistic data bank as it is emerging from a feasibility study currently in progress. Such data banks will best justify their expense by being multifunctional, ie serving translators, technical writers, information scientists and standardization agencies simultaneously.

Finally Mr Arthern critically examined the prospects for the use of various machine aids in a large international organization heavily concerned with various stages of multilingual drafts prior to publication. He also gave a survey of current efforts and plans for machine translation, computer storage of documents and, in general, the prospects for greater involvement of information technology in international interlingual communication.

A common theme in many papers was the danger of introducing new barriers into interlingual communication, barriers resulting from the requirements of the new technology itself. These barriers consist of the various documentation languages, the command languages of the various systems and different formats of data storage which prove a serious stumbling block to the free interchange of data between systems. Such difficulties have been recognized for documentation networks by the European Commission's Committee for Information and Documentation in Science and Technology which was responsible for the introduction of EURONET. The following areas of difficulty have been identified and will be investigated: the translation of the host manuals, the design of a common command language, the introduction of machine translation for titles and abstracts, a common classification system of the kind of the Broad System of Ordering and the creation of multilingual thesauri. The new directorate for the Information Market and Innovation of the European Commission has undertaken a series of relevant studies and is shortly organizing a workshop on a common characterset for all Community languages. The multiplicity of tools at present available requires harmonization and standardization of components and procedures both with respect to software and the data themselves. Though millions of terms are already stored in terminological databanks they cannot readily be exchanged as there is as yet no agreement about a common data structure nor about an exchange format on magnetic tape, despite persistent ISO efforts for the last few years. There is considerable danger of unnecessary duplication of work which besides the waste of human energy will lead to conflicting terminology and translations. Agreements on a number of levels are therefore urgently required among manufacturers of hardware, designers of software, hosts of databases and producers of translations and terminology.

New information technology also requires a complete reassessment of the whole range of linguistic mediation processes and new methodologies of work. Interactive translation and text-editing are already widely used in some organizations. Split VDU screens for original, translation and dictionary display are available but manufacturers are not sufficiently responsive to translators' real needs so that there is still considerable room for improvement as more experience is gathered. Translators will also have to become more versatile to deal with pre- and post-editing of machine assisted translation and the end user will be offered a wider range of products such as raw machine output for information scanning, controlled language versions of abstracts and other relatively stereotype text forms, human revision of machine output besides the traditional full human translation. This diversification will permit a greater volume of translation to be produced more quickly but there is as yet no sizeable body of experience to ascertain the acceptability of these new forms of translation nor an analysis for which texts a particular type of translation is most appropriate.

It was my privilege to open the first Aslib symposium on this topic in 1978. The fact that I am drawing the conclusions on this occasion does not mean that the debate on this topic is closed. Quite the contrary the discussion is just beginning and there are likely to be many more occasions like this one to monitor progress and reassess the orientations taken.

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Aslib and the Translators' Guild

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Following in the wake of two successful co-operative efforts of the Aslib Technical Translation Group and the Translators' Guild of the Institute of Linguists—**Translating and the Computer** in 1978 and **Machine Aids for Translators** last November—comes **Practical Experience of Machine Translation,** a somewhat more ambitious project, jointly sponsored by Aslib and the Translators' Guild.

The theme of this conference, which should attract translators, administrators and computer people in government, institutions and industry, academics, promotors of MT systems, MT users and potential users, is machine translation (MT) in practice rather than theory. Its object is to gather and disseminate information on the state of the art in machine translation in Canada, the USA, the Soviet Union and the Far East, as well as Europe. Speakers in the core sessions will be practitioners (mainly translators) who work on MT systems in regular practical use, and their remarks can be expected to indicate MT's current vices and virtues. The scene will be set by a partly theoretical introductory session and the concluding session, taking a speculative look at innovation and its limits, should suggest where to concentrate future research and marketing.

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Word processing and information management

John Whitehead
Pilkington Brothers Limited

Paper presented at an Aslib Evening Meeting, 25 February 1981

1: Introduction

EVERYONE HERE TONIGHT must be aware by now that we have entered a new, technological era—in fact, a second industrial revolution. If you are not aware of the new developments taking place you are either blind, deaf—or, even worse,—either not interested or of the opinion that it does not affect you personally. Either of the latter points can be fatal! Anyone who feels that they are not involved is going to become the Twentieth Century equivalent of the Dodo and anyone who is not interested in new technology is not, in my view, worthy of being called a professional—whatever his profession may be!

The media have been preaching doom and gloom over the past two or three years. Massive unemployment and heavy redundancies have been forecast, with the so-called 'chip' allegedly taking over everyones' jobs. Those same forecasters of doom—or their forefathers—were also in the van during the first industrial revolution preaching the same gospel—'machines are replacing men!' I wholeheartedly disagree with this sentiment—this new, exciting technological age can be the very key that opens up new doors to equally new and exciting careers. Let me tell you a story:

> 500 years ago, in a monastery quite close to London, a group of monks were quietly preparing a new edition of Boccaccio's Decameron, complete with decorative, illuminated initials. They had taken the usual vow of silence which was only punctuated now and again by the occasional 'Cor' or 'Hoo'.
>
> Suddenly there was a commotion outside and one of the brothers, Brother Mostyn, dashed in and started to wave his arms around alarmingly:
>
> 'We have been betrayed!' he cried.
>
> The monks looked at him in shocked silence, not knowing whether to break their vows and ask him how they had been betrayed. However, he relieved them of that responsibility by continuing with his diatribe in a high pitched, trembling voice:
>
> 'We are redundant, brothers! A fiend called William Caxton has set up a new, infernal machine called a printing press in London. He will take away all our jobs!'

That is an analogy of the present situation as more and more organizations install new and improved technology with the inevitable screams that millions will be made redundant. 500 years ago the number of printers in this country amounted to one. How many are there now? The same situation will arise with the new technology—the monks who can't or won't adapt will end their days tending their vegetable patches,

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whilst those who see the light will certainly find plenty of work and—in my view—will gain in job satisfaction.

The monks saw the printing press as an evil machine, just as the present generation see computers, chips and microprocessors as the Devil Incarnate. That is utter nonsense—a computer is a stupid, inanimate object which needs humans to activate, operate and control it and, once people realize and accept that, they have solved their first problem and started on the road to controlling their own destinies.

Since the late 1960s and early 1970s we have not only learned how to live with computers and computer technology but we have also learned how to use and exploit that technology to meet our own specific needs and demands. So, how did we do it and what is in it for us?

2. Developments in new technology

The use of computers in libraries and information departments came to the fore in America when organizations, such as the Lockheed Aircraft Corporation, spotted the tremendous possibilities of manipulating computer tapes to produce online search facilities. The subsequent launch and extension of ORBIT, DIALOG, DIALTECH, BLAISE, and EURONET DIANE are all now part of history and need not be covered here.

However, such developments were the introduction to computerised systems for which librarians and information workers alike had been awaiting. Their appetites had been whetted and they demanded similar facilities for their in-house requirements. Unfortunately, that was also where they encountered their first major problem. At that time computers were all of the expensive mainframe type—they were expensive to buy, expensive to operate and expensive to maintain. Consequently, priority jobs were given preference—salaries and wages (and I personally have no objection to that priority), accounts, orders and order execution and so on. Information storage and retrieval was well down that priority list. However, breakthrough time eventually came and it was thanks to companies such as IBM, who produced a software program called STAIRS (Storage and Information Retrieval System) for information workers. The cost, regrettably, was still pretty steep and even to-day the STAIRS software package will cost you over £400 per month to rent. A second major problem facing information workers was the so-called 'Computer mystique'. Computer professionals had for years jealously guarded their own empires and had made it difficult for end users or customers to influence what should be done or which hardware and/or software should be used for particular situations. Their view was that such matters were best left in the hands of those who knew best and were better qualified and experienced to know what was available and what could be done.

Then, in the 1960s, came the breakthrough for which information people had been waiting: the development and introduction of the minicomputer. A company called Digital Equipment Corporation had been set up in America in the 1950s and they introduced a range of equipment known as 'Programmable Digital Processors' or PDPs. These were minicomputers with tremendous computing power and facilities and which quickly revolutionized the computer world. Running parallel to those developments, studies were being carried out in the electronics industry, particularly in circuit technology. Printed circuit boards comprised the heart and brains of computers and new technology enabled those printed circuits to be miniaturized using Large Scale Integration techniques. Using silicon chips as a base, the electronics geniuses—or are they genii—were able to produce circuits, normally 28 cms by 50 cms, on a chip smaller than the head of a nail. Developments reached the stage where a whole computer circuit system could be reproduced on a small silicon chip and those form the basis of today's microprocessors. This advanced technology also reduced the production costs at a dramatic rate. Today, the circuitry for a typical microcomputer is contained on a board much smaller than a typical library catalogue card. That board will include a microprocessor to perform the logical operations of adding, subtracting and moving or shifting data within the central processor; a second will contain the core or main memory needed to store the data and program instructions to operate the system; and a third will contain the input/output circuitry which makes it possible to plug in other devices, such as screens or VDUs, printers, and disk drives. As a result, computers have become smaller and cheaper with some microcomputers now costing as little as £100.

In the late 1960s, librarians and information workers started to look more closely at the new minicomputers. Experimental work started in the U.S.A., Canada, Australia, and the United Kingdom. Regrettably, computers—even minicomputers—are useless without the right software. That is, the programs which operate the system and allow you to instruct the dumb machinery to follow your commands. Even in the early 1970s, software of the type and quality then in use on mainframe computers was not readily available for use on minicomputers.

However, librarians and information workers do tend to be a pushy lot and they started to badger people until suitable programs were produced to meet their specific needs. Examples include CAIRS (Computer Assisted Information Retrieval System), developed by the British Food Research Association for use on such minicomputers as Texas Instruments and DECs; ADLIB, developed by the Lipman Management Resources company, for use on Prime computers; and STATUS, developed by the Atomic Energy Research Establishment, and available on a whole range of computers including minis.

The computer mystique disappeared almost overnight. It is now accepted in most areas that technology develops far faster when it is user-oriented and user-led—when the customers can have their say and make their demands rather than leaving it to the computer professionals to say what they think can or cannot be done!

3. Word processing systems

You are all now probably asking the question—'What has all that got to do with word processing?' Word processing systems developed along a different route as I will explain in a moment, but the link is the word 'convergence'. Word processors are, basically, no more than modern, updated and uprated typewriters. However, the development of word processing systems, along with the moves being made by computer manufacturers into word processing areas, has resulted in systems ideally suited to meet many of the needs of librarians, information officers and other people generally concerned with information management. The systems are relatively cheap, costing as little as £3,500. That is, if you should wish you can buy a word processor and get a microcomputer free—as the current advertising campaign by Commodore says! Word processors can operate independently or as linked systems; they can be used as computer terminals to access mini- and mainframe computers—whether in-house or external; they can automatically produce reports and other documents and then store them in an easily retrievable format; and, they can communicate with compatible equipment. They will also write your letters for you by taking standard paragraphs from a store and putting them together to form the text.

3.1 Word processing developments

What is a word processor? A pencil is a word processor and, according to advertisements on the Underground some months ago, so is an Emphasizer. That, of course, evades the question, and I will answer it simply by saying that, in my view, the term 'word processor' is a misnomer. It gives entirely the wrong impression of what a word processor can do, and IBM, who invented the term, have a lot to answer for. Perhaps we should organize a competition to find a more suitable name for this type of development! The name came from the West German branch of IBM in the early 1960s when they started a marketing exercise to sell more of their correcting typewriters. Coined originally as 'textverarbeitung', it was based on the concept of using a typing pool configuration with a number of these machines. 'Textverarbeitung' was quickly, and loosely, translated into word processing by the English-speaking branches of the company.

These machines were, therefore, originally produced to mechanize the typewriting functions of offices but they have developed so rapidly and so extensively that they have become synonymous with the so-called 'Office of the Future'. Having mastered the text editing facilities of their machines the word processing manufacturers started to extend their capabilities until they became intelligent terminals, capable of undertaking a wider and more extensive range of services. These included electronic mail, COM input, terminal access to in-house and external computers, telex access and communications links to compatible equipment. By producing and supplying suitable software programs, the manufacturers were also able to extend the facilities to include basic data processing capabilities, information storage and retrieval, and electronic message switching. A feature of this particular development has been the amazingly low prices that word processing manufacturers have been charging for their equipment and software packages.

It did not take the computer manufacturers long to realize that these machines, which were beginning to penetrate their markets and areas of operation, had tremendous potential. The computer manufacturers, quite naturally, jumped on the bandwagon. Convergence became the 'in' word and most of the major companies started to supply word processing software for use on their own computers. In addition, as a natural development, they also started to develop and sell their own word processing systems using their small computers as central processing units for shared or distributed logic systems. Major examples of this type of development can be seen in DEC's WS200 system, based on their PDP 8 and 11 minicomputers; IBM's 3730 and 5500 systems; Wang's Office Information System based on their VS minicomputer, which is also extremely powerful; AES's developments, which include their Multiplus shared and distributed logic systems; and the recently announced

Ethernet system developed by Xerox in America and to be marketed by Rank Xerox in this country.

Even the microcomputers now being used in schools and the home, machines like the PETs, the Apples and the Tandys, all have word processing software packages available. This has given them the power to not only edit text but also to store and retrieve information to a limited degree. This revolution—and it must be called that—brought computers into the everyday world of the man in the street, but it needed a catalyst like word processing to bring about that change. Even more important, as far as the users are concerned, is that they are now in a position to bring pressure to bear on the way such systems are developed. Typists and secretaries with only basic training on these systems are now able to produce short, simple computer programs to meet their office needs. Information workers have never been in a better position to influence developments or even produce their own programs to meet their particular requirements and demands.

Costs are dropping as microprocessors become more powerful and less costly to produce and the storage of information is also becoming cheaper as newer and more sophisticated storage devices are introduced onto the market place. This allows the most budget conscious of firms and organizations to reluctantly agree that there is cost justification in acquiring such equipment. A small stand-alone word processor, with a built-in microprocessor providing basic computing needs, and with a comms link to allow the machine to be used as a terminal to access in-house and external computer data bases for information storage and retrieval, can cost as little as £8,000. A small cluster of word processing workstations, comprising screens, keyboards and printers, linked to a separate central processor and with a central disk storage facility with a capacity of around 5mB, can cost as little as £20,000, depending on the number of workstations required. That is just a basic configuration and can be built up as demand increases by the addition of further screens, printers and disk storage. Screens can cost as little as £1,200.

Today, word processing is a multi-million pound business which has mushroomed over a few short years. Even though IBM was the leading light in the early days and, until fairly recently, controlled around 80% of the market, today there is a bewildering array of word processors and word processing systems available from well over 100 manufacturers and suppliers. This, in itself, poses a tremendous problem for prospective users who have to thread their way through a maze of different systems, many of which do not offer standard facilities and are not compatible. At a recent seminar one speaker, representing a large multinational company, expressed the view that within a very few years the present 100 or so manufacturers and suppliers will have dropped to about 10, with perhaps only 5 of those having a long term viable future. Many users and observers share this view and most have very clear opinions about which companies will survive.

3.2 Word processor components

A word processor consists basically of an alphanumeric keyboard, with some special function keys, a letter-quality printer, a memory unit, a microprocessor to provide the operating logic, an external storage unit for magnetic storage media and the software for operations and applications. It may also have a display which can range from a single line, or 'thin window', to a large A3 size screen capable of showing two full pages of text. It can share peripherals such as printers, large external storage units, optical character recognition (OCR) and photocomposition equipment. Word processors can be 'intelligent' terminals working in a stand-alone configuration, or 'dumb' terminals sharing a central processing unit or CPU. The various components are described as follows:

The keyboard

All word processors have a keyboard which includes, apart from the usual alphanumeric character set, a number of control keys permitting editing functions to be carried out. The logic which implements the editing functions is normally contained in a microprocessor.

The screen

Not all word processors have screens, although that trend is increasing. The simplest and cheapest type of screen displays just part of one line of text, the one being typed, which is generally known as a 'thin window', while some screens, by contrast, can display a full A3 page. Screens vary in size, shape and type but most employ a cathode ray tube, similar to those used in the domestic television receiver, with a phosphor display in red, green or white on a dark background.

Most screens have an area, usually at the top, reserved for the display of control information such as the name of the current job, the function being carried out, the setting of tabs and margins and other information useful to the operator.

The print unit

Each word processing system will have a printer or printing facility which is either linked to the keyboard, as with a conventional typewriter, or which may be a physically separate unit. The most common print units in use are the golf-ball printer, as on many electric typewriters, and the daisy wheel printer. On both types the print element is removable so that a variety of character sets and type founts is available. Some cheap systems, such as the software activated microcomputer-based systems, use a dot matrix printer which produces a typed script but not of letter quality.

Storage systems

Modern word processors always have some form of internal magnetic memory to record typed information, usually equivalent to a page or so. In addition they have an external storage facility, the most common of which is the floppy disk or diskette system. These 'floppies' usually have a capacity ranging from about 400 kilobytes to 3 megabytes or from 50 to 1,200 pages of text. One big advantage of disks is that text can be retrieved directly from anywhere on the disk and can also be transferred to and from the disk relatively quickly. When being used, they are attached to the system through disk drives, of which there are usually one or two, but occasionally three. The number of disk drives determines the number of disks which may be in use at any one time. Some of the larger word processing systems, however, now incorporate a 'hard' disk system as a storage medium. These are the storage units conventionally used on computer systems and have a much larger capacity and faster access time. Shared logic word processing systems, for example, can have hard disks with a capacity ranging from 5 to 380 megabytes of information or from 2,000 to 150,000 pages of A4 text. The continuing downward trend in digital storage costs will make bulk electronic storage cheaper than paper by the mid-1980s. Improvements in the file management and organization systems and, particularly, the search techniques will make electronically stored information more easily accessible. Text filing and retrieval systems are being developed and they range from systems with simple access, via an index, to complex full inverted file systems similar to IBM's STAIRS software package.

Data bases produced and developed on such systems can, thanks to the communication protocols now available, be accessible from any location at any time. Decentralized organizations can maintain a single, up-to-date centralized library of text and data. Use of word processing workstations to access this data using free text search techniques by file names, leading names, key words or by multiple text strings using Boolean logic, is now possible.

Processing logic

It is the logic in word processors which provides the various functions, such as editing, storing and retrieving text, and which controls all the components of the system. In all systems some of the logic is in the form of hardware, that is to say, electronic circuits. On the more modern systems, however, most of the logic is in the form of software fed into and stored in the internal memory of the word processors. The programs are executed by a microprocessor in the equipment when the operator indicates that certain functions are to be carried out by depressing the appropriate control keys. The particular advantage of software is that it can be changed more cheaply than hardware and both the supplier and the user are, therefore, able to enhance their systems more easily. This also means, in some cases, that the operators are able to write their own programs for their systems if they wish. Software programs also allow word processors to communicate with each other and provide the protocols to enable them to act as computer terminals for direct access to mainframe facilities, whether internally or externally. Software programs also provide the storage and retrieval facilities which are so important to information workers.

The software programs are specifically written for word processors by the manufacturers and are surprisingly cheap when compared to computer software packages. For example, a software disk for use on one particular stand-alone software based word processor, to provide an information storage and retrieval system, will cost exactly £75. A similar program for use on a mainframe or minicomputer can cost £25,000.

Examples of software programs include the following:

- Financial proofreading—ideal for balance sheets, budgets, etc. This program will do all your adding, subtracting, percentages, as well as aligning columns and moving them to new positions. For example, in a balance sheet it enables you to move the previous year's figures to make way for the new year. The program will even check your maths for you.

- Records organization—this program will arrange stored information in any sequence whether alphabetical or numerical, by name, title, location, date, report number, etc.
- Search and replace—this program allows you to search for symbols, words, phrases, sentences, or groups or strings of characters. It will then replace them with whatever you wish. For example, in typing a report which requires the name of your company or organization to be included a number of times, simply type in a symbol and replace later. Such as 'PB' replace with 'Pilkington Brothers Limited'.
- Extract, sort and print—this program allows you to remove particular information from your records and then arrange that information into any sequence and in any order before printing it in any format. This is ideal for forms, tables, telephone directories, and information bulletins whether of the indexing or abstracting types.
- Line drawing—this program allows you to design, draw and memorize outlines for standard forms, lists, tables and charts. This has an ideal application in library housekeeping systems such as loans, periodical supply and circulation systems etc.
- Communications—this program enables word processors to emulate computer terminals and enables them to communicate with in-house or external computers, with other compatible word processors and also act as electronic message switching and electronic mail terminals.

Additional input

OCR, or Optical Character Recognition, equipment is being increasingly utilized as an input medium to word processors. OCTs can 'read' certain founts with high reliability and this allows organizations with golf-ball or daisy-wheel typewriters to input text straight into the word processor by typing the initial draft on the typewriter and then feeding it through the OCR, for editing, correcting and storing. This extends the utilization of word processors in a large office environment. These systems are also ideal for transferring information stored on one system to another, possibly, non-compatible system.

Communications

Of the 30,000 plus word processors in use in this country it is estimated that only a very small percentage are equipped for communications use. Those that are so equipped are generally restricted to intra-company transmission to like machines having the same protocols. This has been a surprising feature of word processing development. The communications facility is freely available and yet is under-utilized even though the cost of using word processors for this type of operation is relatively low. The major problem has been that protocols are not yet standardized and too many of the present machines on the market are incompatible. A second problem has been that word processors are not yet capable of automatically storing and forwarding messages.

One of those problems has recently been solved to a limited degree by the introduction of protocol translators which enable previously incompatible systems to communicate with each other, regardless of protocol differences. The general view is that intra-company communications using word processing systems will become a major growth area in the near future. This will be particularly true of electronic mail and electronic message switching.

Searching and records processing

Most word processors are capable of searching for and indicating the location of a given character string of between 16 and 128 characters. Some systems provide a facility known as 'record processing', 'information processing' or 'list processing'. This facility consists of, essentially, the ability to sort, select and merge files of text/records. This marked an important departure from the simple text manipulation by character strings to organizing and processing text according to the significance of the contents of that text. This approach to word processing systems has brought them very close to the information retrieval facilities available on data processing systems. Use of Boolean logic is being extended and systems compatible with such external services as Lockheed's DIALOG, and internal systems such as STAIRS, CAIRS, and STATUS are becoming available. IBM, for example, recently launched their DISOSS sofware package for use on their 3730 shared logic word processing system. DISOSS stands for Distributed Office Support System and it has made it possible for operators to create and maintain large document file systems with a sophisticated filing and retrieval facility.

During late 1980, the Systems Development Corporation (SDC), a company better known for its ORBIT online search facilities, introduced a completely new information storage product called the Records Manager. This product was designed to link communicating word processors and computer terminals into an integrated information system. The word processors are used to create and revise documents and the Records Manager files and finds them. The system combines the generation, filing, retrieval and distribution of documents into one convenient and effective system.

Using a single menu of plain language commands and questions the system will file, retrieve, review and mail memos, letters, manuals, plans, reports, minutes and all other text-based documents. No predetermined index is required—all that is needed is a content clue, such as author, title, date, topic, idea or phrase. The search pattern can be expanded or refined even during the enquiry. The size of the system depends on requirements. It starts with a basic unit with a storage disk equal to 80mB increasing to an ultimate capacity of 4 disks of 675mB of storage. The system has 8 communication ports for word processors and terminals with the option of an additional 8. Communications protocols are ASCII TTY asynchronous with speeds from 110–9600. baud.

3.3 Word processing systems

To-day users have to decide which type of system to install before they can even give consideration to which of the many suppliers offer the most suitable equipment.

There are three basic types of word processing system presently available and within those categories there are several distinctive types:

A. *Stand-alone word processors.*
(i) Mag-card or magnetic tape non-screen correcting typewriter.
(ii) Word processor with single line or 'thin window' display with mag-card or floppy disk storage facility.

(iii) Word processor with part or whole page visual display unit and floppy disk storage.

(iv) A new breed of machine recently entered the market at the lower end of the price range but with wide-ranging facilities. These are electronic rather than electric typewriters and are a sophisticated development of the IBM MTST type of system. The machines can communicate, link together as cluster or shared facility systems and will also link into shared logic systems to share or gain access to, for example, stored information. Storage is usually on floppy disks.

B. *Linked systems*

(v) Shared logic systems—Word processor screen and printers, or workstations, activated by a central processing unit, with each workstation linked for central storage and communication. Storage by floppy disk or hard computer-type disk systems. Little or no data processing capability.

(vi) Shared facility systems—Similar to the shared logic systems except that each workstation can operate independently as a stand-alone word processor with its own built-in logic and storage facilities. This system is particularly useful if increased personal security is required or if the CPU should fail for some reason. Storage as for shared logic systems but with individual floppy disks drives as required.

C. *Computer based systems*

(vii) Converged systems where the workstations are activated by a computer or minicomputer acting as the CPU. Storage by floppy or hard disk systems. These facilities also include a marked degree of data processing capability.

(viii) Word processing software programs which are available for use on mainframe, micro- and mini-computers and which merely need suitable hardware to convert existing computer systems to include word processing facilities. Storage as for shared logic systems.

4. Applications in information and library functions

Most word processors are capable of searching their data store, whether on floppy or hard disks, and can then display and print the information retrieved in any sequence. Usually the word processors require a software program to access the information. These programs were not specifically prepared for information scientists but were developed for such administrative functions as personnel searches—searching for the right shaped peg to fit into the right hole. Another example is the in-house telephone directory which can be changed regularly with no fuss or bother by extracting or adding names and numbers; or from a list of addresses of individuals, you can select those who wish to receive specific information. This program is ideally suited to information needs and allows search patterns using key words to access the stored data in a similar manner to a computer.

Text storage

Let us now consider in more detail the text storage facility of word processors and the manner in which they interpret the data stored. The major considerations concerning the storage facilities of word processors are: the capacity available to hold information; the security of that information; and the method of filing and indexing it for retrieval. The total storage capacity of a system can affect the size of a document or documents which can be manipulated at any one time, although the relationship between this size and the total storage capacity can be difficult to ascertain. However, the maximum storage capacity is a useful figure to know, if it can be established. For security reasons, it may also be necessary to copy files or to protect them from alteration.

The storage capacity of word processors usually consists of a small amount of internal memory holding some or all of the system software—if the system is software-controlled—and probably about a page of text, plus the backing storage in the form of magnetic tape or disks. The difference between the total storage capacity and the text storage capacity is partly accounted for by the space taken up by system software. For example, in a stand-alone software-based word processor the system software is provided on a system disk which would be fed into the internal memory of the word processor through the disk drive before any work commences.

Where it is necessary to take security copies of stored files, this can be done on most systems provided they have a dual disk drive system. The files are then copied from one disk to another on the second disk drive. Stored information can also be protected against inadvertent or unauthorized alterations. It is not possible generally to protect part of the text on a disk or tape except by software. This may mean wasting storage space or grouping sensitive documents together, and, if the latter course is taken, it is worth remembering that if the protection is lifted to add another document, the documents already on the disk are unprotected.

4.1 Potential applications

(i) Order processing and budget control

By utilizing the communications mode it is possible to process orders directly with a supplier who has compatible equipment. Book orders can be fed into the system using a formatted table so that the cursor on the display moves automatically to each space to be completed on the form. The completed order forms can be stored in the disk storage unit until each has been prepared and then the whole batch transmitted to the supplier, using the communications mode. Such a system, however, would require the approval of the in-house Supplies function and the British Telecom Ltd., the U.K. post the telecommunications authority, before it could be implemented. Advantages of such facilities:

(a) Quick and effective with no transmitted errors;
(b) Automatic storage with retrieval facility to allow updating and checking.
(c) Order form can be edited to form catalogue entry on receipt of publications.
(d) Allows standard letters to be produced to progress orders, notify the enquirer that the publication has been received, or notify him of any delay in the order.

(ii) Library catalogues; auditing and stock control

By utilizing the order processing forms an automatic library catalogue can be produced. Such equipment will allow access by author, title, publisher, date, ISBN number, price, classification, location and any other parameter which may be required.

The communications mode enables union catalogues to be prepared, without additional cost, by transferring details of new additions to and from each site within the organization. Off-site access to the catalogue can also be provided. Book lists on any subject or by any authors, or by location, can be produced automatically. Auditing and stock control facilities can also be implemented on this type of system.

(iii) Circulation control

A similar system for library loans can be prepared, using a formatted form layout for Library Loans. As books are issued the operator will type in the details in a similar manner to the book orders form and store the details in the storage facility. The system will provide an automatic printout of books on loan on any date, to any customer, by any department, section, group or project, by classification, by author or by title. Each book or publication in the system can be traced immediately. Standard letters notifying holders of any overdue title can be produced automatically and the next person waiting to read that publication be notified that it is available.

(iv) Periodicals control and circulation

The system is particularly suited to libraries with a large input of periodicals. By using a formatted table, the system will identify any issues of any journal or periodical which have not been received, whether they are arriving on time or not and who wishes to see them on circulation. This system will also provide a continuous up-to-date record and complete history of each journal and can even produce a print-out of budgeted and actual costs of all journals in the system. Standard letters to suppliers and publishers requesting information on missing or late issues can be produced automatically.

Circulation lists can be updated regularly and be produced automatically. The equipment will also allow searches to be made for any issue, using the names on that circulation list. Lists of journals can be produced easily and quickly and in any sequence.

(v) Information storage and retrieval systems

(a) In-house reports and documents

By using a word processing facility to produce reports and other documents, the ability to store those reports to provide full text retrieval is now available. The system will search each document for key words or descriptors and either list the details of the relevant reports or will display the relevant sections of each of the documents on the screen.

A listing of reports and documents in specific areas, by author, title, groups, data, or location will be available. This will be ideally suited to the production of, for example, monthly lists of new documents or bibliographies in narrowly defined areas of interest.

(b) External information

Abstracts or indexes of external information can be included on the system by again using a programmed tabular format. This will provide a 'Lockheed'-type Boolean logic search facility to identify papers, articles, conference proceedings, etc., published externally. The information can be stored, sorted and printed in any sequence. This will provide a regular indexing or abstracting bulletin and also the ability to produce bibliographies. Input, unfortunately, can only be achieved by typing the information into the word processors and this will continue until an optical character recognition system, capable of reading all or most type faces, becomes available to allow automatic input to the storage system.

(c) External access

By using the communications mode, access to the internal information data base can be made available from external sites. However, to ensure full security of the information, a security code can be applied to limit the access to authorized users.

(vi) Online searching

Word processors with the communications mode can be used as computer terminals to access external commercial data bases, such as Lockheed and SDC. The information can be received, stored and edited using the processing facility of the equipment to erase the instructions, lists of descriptors and other information considered unnecessary by the enquirer. The editing function of a word processor can be used to 'clean up' the information provided. Unfortunately, the legality of this method had been questioned.

(vii) Selective dissemination of information systems

By using the retrieval facilities of these systems, SDI profiles can be fed into the storage units and, whenever relevant information is received, it can be matched against those profiles and the enquirers notified by setting up a standard letter procedure.

4.2 Applications of word processors in library and information work

A wide range of applications and use of word processors in library and information areas have been and are being developed. Some examples have been described in the literature and include the following:

- *South East Thames Regional Library and Information Service*

Using a BDP 90–02 Word Processing System, the South East Thames Regional Library and Information Service is maintaining an efficient and economical indexing system to the Sussex Postgraduate Medical Centre Library and 13 other libraries in the South East Thames Health Authority Region.

Each of the libraries in the Region is responsible for ordering its own books and, where titles were duplicated, classification and cataloguing is also duplicated. By installing a word processor a number of the libraries are now able to take advantage of the centralized, automatic production of high quality standardized catalogue cards.

When a new book is ordered by any of the 14 libraries a check is first made to see if it has already been recorded on the word processor store and they store around 250 titles on each disc. If not, the relevant information about the book is fed into the store. When required, 5 catalogue cards are produced automatically by the BDP and posted to the library and disc returned to store.

The time taken to produce the cards is greatly reduced and the cards themselves are of a uniformly high quality. The equipment is now being considered for the production of a union catalogue of journals within the system. The system was devised by John Mills, the Regional Librarian.[1]

• *British Ceramic Research Association*

BCRA produces a regular abstracting publication called 'British Ceramic Abstracts' and for years it was produced in the conventional manner using letterpress printing. In the 1960s, however, heavy costs of printing forced them to revert to camera-ready copy produced by IBM golf-ball typewriters, which were then printed by offset-litho. First attempts at using word processing equipment were in 1971 using one which prepared a punched paper tape. In the meantime, considerable developments were taking place in the computerized handling of information and computer technology in general and the BCRA consequently switched to a Data Recall Diamond, or *D*ata *I*nput *A*mended *on* *D*isc, word processor which used the floppy disc type of storage referred to earlier.

Each floppy disc will hold 120 A4 sized pages of text and, in addition, also carries the program written by Diamond which controls the operation of the equipment.

The system now operates in two ways:

- straight forward input and editing.
- text sorting and searching which extracts relevant portions of the text for the production of the abstracting journal.

As a result of this development the BCRA can now input the abstracts on to the word processor, edit and sort them and then store to await the monthly publication of the 'Abstract Bulletin'. As well as producing the bulletin in any sequence they desire, the word processor will print index cards, produce special topic selective bulletins, update each monthly bulletin to produce an annual cumulation complete with author, subject and title indexes using the same equipment. The BCRA information staff will soon be in a position to undertake machine searching using author or key words for subject searches.[2]

• *National Reprographic Centre for documentation*

The British Library has granted a sum of £27,000 to the NRCd to install a word processing system in order to determine the benefits of the equipment to specialised information centres and similar institutions.

The NRCd will explore a number of areas where the value or practicality of word processors can be considered:

- Information retrieval—investigation of the scope for providing a limited form of automation—information retrieval from NRCd abstracts;
- Computer output microform—investigation of the feasibility of transferring data from the word processor disc stores to tape suitable for driving COM recorders.

The British Library has set a high priority on the reporting of results via publications and short courses and liaison with other related work. The equipment purchased is a Wang 25/2.[3]

- *The Technical Communications Centre of Pilkington Brothers Limited* is experimenting with Vydec and AES word processors in such areas as accessing in-house reports and documentation and external data bases; acquisition and control of journals and books; and communication links to other sites, including electronic mail facilities. Medium term plans include use of shared logic facilities for full text storage and retrieval of in-house documentation.[4]

- *Howson-Algraphy Ltd.*, a subsidiary of Vickers Ltd., is using the ICL 7700 word processing system as the input and retrieving system for an in-house online storage facility on an ICL mainframe computer. All typing, editing, storing and searching is undertaken on two word processing workstations. The software on the main frame is STATUS.[5]

- *Unilever Research*, at Port Sunlight on Merseyside, is using a Philips word processor in a similar manner but accessing the DECO software system through Unilever's own computer bureau facility. The system is used for storage and retrieval systems and for bulletin preparation.[6]

- In America, the *Electronic Data Systems Corporation* is using an AES Plus stand-alone word processor in its Library/Corporate Information Center for information work. It provides access to the company's in-house documentation, equipment manuals, and report and journal literature. The system is simple enough for non-librarians to maintain and requires the minimum amount of time to operate. Using the AES with the Records Management software disk, EDS realized that it could not only produce card catalogue sets and several different kinds of alphabetical book lists, but it could also search the data base using the Global Search and Replace software disk provided by the suppliers.[7]

- *The Congressional Research Service of the Library of Congress* in Washington, D.C. has set up a total system to provide research and policy analysis facilities for the members, committees and staff of the U.S. Congress. The CRS text processing system, which is now in operation, draws data from many sources in an online mode and provides for the editing and formatting of text offline using Lexitron word processors. Reports can be produced as hard copy, microfiche or can be typeset. The system was developed in an evolutionary way over a period of several years. It started in 1973 with an order for 15 word processors to handle the typing of the CRS reports. Those 15 machines quickly grew to 70 and further new technology equipment was added until CRS had the most advanced, highly integrated, inter-communicating system for text processing in the world. The CRS system now includes in its configuration not only word processors but also a mainframe computer, data processing facilities, COMs, photocomposition, electronic mail and dictaphone equipment.

The Library of Congress is leading the way and many more are following similar routes. But what about the future? Where will all this new technology take us?[8]

- In this country the *British Library R & D Department* established an informal Word Processing discussion group in 1979 to bring together information managers and research workers from industry, commerce and Government institutions who have wide experience of using word processors and who are developing techniques for using word processors, either along or in conjuction with computers for library and information procedures. Only by bringing people together and discussing each other's developments and techniques will it be possible to utilize such technology to the full. The British Library intends to make good use of the vast amount of information which is being filtered through to the discussion group. The response to their request for information from librarians and information workers on their work in this area has been excellent, and once it has been coordinated and publicized will give those people who are seeking such knowledge a great deal of food for thought.

5. How to choose a system

Word processing systems and applications have been identified and briefly described. However, they will not suit everyone's needs and it is important that the needs are considered uppermost in everyone's mind when they are looking for their ultimate automated system. The wisest move to make when looking for that goal is to discuss requirements with the company's computer manager and seek his help and guidance. You may find, for example, that your company has set guidelines on what equipment can or cannot be acquired, to ensure compatibility across the company. If professional advice is not available within your organization, talk to someone who has already installed similar systems to gain the benefit of their experiences. If necessary, employ a consultant to guide you through the maze of equipment, peripherals and software.

The following checklist may help in making that decision:

1. Prepare a checklist of particular requirements for word processing systems. This will include not only text editing requirements but also all the other added benefits of such systems.
2. Using publications, such as the 'Guide to Word Processing Systems' draw up a short list of those word processing systems that match your requirements.
3. Check with other departments in your organization to ascertain what equipment is already in use and why it was chosen.
4. Wherever possible, discuss your requirements with other users of each of the word processors on your short list.
5. Arrange for demonstrations of each word processor and ensure that you receive a 'hands on' demonstration either for yourself or for whoever will be your dedicated operator, to ensure that the equipment is 'user friendly'.
6. Check that the equipment you finally choose is compatible with any other machines within your organization, or at sites where you expect to have to communicate.
7. Check that the servicing, maintenance and back-up facilities for the equipment chosen are adequate and ascertain the call-up time for emergency services.
8. Check the quoted prices very closely and watch for hidden extra costs. Ensure that the supply of such essentials as floppy disks, printer ribbons and print wheels is adequate and continuous. Beware of non-standard equipment and stationery!
9. Discuss your proposals with the relevant local union, if you have one, and get the union's approval of your plans.

10. Remember ergonomics! Equipment of this nature does tend to change the office environment and this must be taken into account, particularly if other new office equipment has to be purchased to cater for the word processor.

11. Make sure that future plans are taken into account when planning the purchase of such equipment. If your short or medium term future shows a need for 3 or more word processors, seriously consider the shared logic or shared facility systems available.

12. If you have a computer within your company remember the software packages available to convert to word processing use.

6. The future

The creation of the office of the future is, however, a gradual process. The first step towards this has been the addition of electronic intelligence to many traditional office products. Typewriters, photocopiers, facsimile transmission devices and telephone systems are now being controlled by minicomputers with the consequence that many office tasks are open to automation in a big way and can now provide the additional benefits of inter-office communications of text and data. As office products and telecommunications adopt computer type digital techniques so common machine language will also be established. The fact that the logic, arithmetic and storage devices in a typewriter are the same as those in a computer means that ultimately all those pieces of equipment can use the same central processor and memory systems.

All this, of course, should be good news to the librarian and information officer. The automation of the office means that similar facilities will be made available for the automation of library facilities and information services. It must also pose a very large threat to those very same people: the electronic storage and retrieval of information will mean, in the future, that paperwork in the office environment will, to a large degree, disappear and every employee, whether a secretary or a manager, will be able to search for and retrieve any information available in the system. The 'system' in this instance is not confined to in-house facilities, but also the many external services which will become more easily accessible—services such as Lockheed, SDC, Prestel, Ceefax, Oracle and many others which will be arriving on the scene shortly. Internal viewdata systems, similar to the Post Office's Prestel service, will become prevalent in larger organizations and the question will arise 'Who will feed and supervise these services?' It has to be the information workers—hasn't it?

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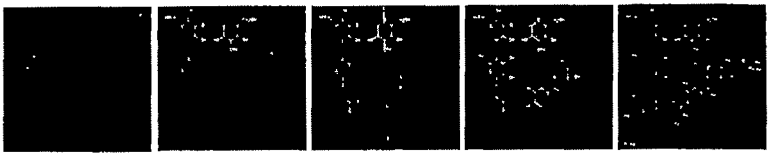
EDITOR'S NOTE

Owing to pressure of space in this issue, it has not been possible to include reproductions of the numerous overhead transparencies which accompanied this talk.



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ROYAL SOCIETY OF CHEMISTRY

LASER and Prestel

Jean Plaister

Director, London and South Eastern Library
Region (LASER)

Paper presented at an Aslib Evening Meeting, 18 March 1981

Introduction

THE MAJORITY OF librarians and information officers are uncertain about Prestel. As yet, they are probably wise to be wary but not I maintain, chicken-hearted. We do not yet know the effect Prestel could have on the traditional services provided by libraries and information centres or the potential it could have for widening and expanding services. There is every reason to find out, however, and in talking this evening about LASER and Prestel I also want to deal with the insight our work has given us into the implications of Prestel.

For the librarian and information officer two main aspects of Prestel need to be considered, firstly the exploitation and use for clients of the information on the Prestel database, and secondly the use of Prestel to promote his own organization's information i.e. the community information of a local authority. Each of these aspects requires a different approach and individual techniques, but both require an appreciation of the Prestel system—its aims, achievements and cliental if they are to be fully exploited.

Background

Fortuitously, LASER is involved in both these aspects and in order to put you in the picture I will give you a brief summary of the developments which led to LASER's participation in Prestel.

Prior to the establishment of a public Prestel service, the Post Office introduced a test service. This began in June 1978 and continued until March, 1980, thus overlapping the introduction of the public service. As part of this test service the British Library invited the Aslib Research and Development Department to design studies in two areas:—

(i) the potential of Prestel as a vehicle for the dissemination of community information
(ii) the effect of Prestel use on the reference services of public libraries

As a result, six public libraries in the London boroughs of Bexley, Hounslow, Sutton and Waltham Forest, and in Birmingham and Norwich participated in these two studies. These libraries collected and sent in information relating to their local communities, and Aslib staff then formatted this for input to Prestel through an editing terminal. During 1979 Aslib had indicated that it would not continue this service when the study period came to an end and LASER was approached to investigate its potential involvement in this service.

LASER had discussions with the Post Office and Aslib at the beginning of 1980 and it appeared that it would not be economic for either individual library systems or local authorities to input their own community information to Prestel. The Post Office was, therefore, interested in LASER acting as an umbrella organization for libraries and local authorities within the region for this purpose.

THE LASER Management Committee felt that this activity fell within LASER's objects as laid down by the Constitution and an investigation was carried out into the practicability and economics of providing this service. This led to the LASER Council approving the establishment of LASER as an umbrella organization and information provider to Prestel.

At about the same time as LASER was establishing its 'umbrella', the Department of Industry made available to the British Library a sum of money to rent Prestel sets and place them in public libraries and other suitable libraries and organizations in order to monitor future potential. The British Library Research and Development Department asked LASER if it would act as its agent to manage and monitor these Prestel sets and this was agreed. From these two strands—the LASER umbrella and the Department of Industry Prestel sets—a research project was developed known as the LASER Prestel Project the details of which are as follows:

LASER Prestel Project

LASER is carrying out a programme of research on Prestel with the aid of a grant from the British Library Research and Development Department, and the cooperation of the Department of Industry and British Telecom. The project continues work carried out by Aslib, who are also pursuing specific aspects of Prestel and community information. Laser and Aslib are cooperating in the research and development of a community information Prestel file.

In particular, LASER is investigating the following:—

(i) the best means of coordinating, standardizing and facilitating input from members within the LASER 'umbrella' (coordinating organisation). Elements to be studied include
  (a) Notification procedures
  (b) Staff training
  (c) Liaison with members of the umbrella with local input facilities.
(ii) the design and indexing of a suitable databank structure for community information, taking into account the large number of sub-information providers (sub-IPs), their varying intentions and financial commitment, and the likely rate of development over the next few years.
(iii) information updating, in terms of frame requirements for the umbrella, updating frequency, implications for work scheduling and the effect of costs on LASER H.Q. staffing and equipment

(iv) the role of an umbrella organization in the co-ordination and development of community information on Prestel. LASER is considering the types of information most suited to Prestel in relation to possible user needs and sub-IPs' data collection abilities. An indexing committee is considering responses from users, research results on indexing, and ways of improving directories, indexing on the system and other means of access to community information

(v) the use made of 32 Prestel sets placed in libraries and information centres from August 1980 to July 1981. Information being collected covers costs, user reaction, staff comments, promotion methods, use patterns and technical difficulties

(vi) Prestel equipment available. LASER is collecting literature on Prestel receivers, editing equipment, intelligent editing systems and private viewdata systems. with a view to predicting library requirements in the next year or two.

In my opening remarks I spoke of the need to evaluate Prestel and I will now attempt to do so using the experience we have gained within LASER.

Prestel as a library and information tool

The LASER Prestel Project continues until June but already there are indications which enable me to comment on the use of Prestel as a library and information tool. You will appreciate that I am speaking here in a personal capacity and that the detailed results and recommendations which appear in the final report may not be identical with mine but I doubt if they will vary to any considerable degree.

Originally it was anticipated that the Prestel database would be used by the individual in his own home, in practice the majority of the 9,000 Prestel sets joined to the system (January 1981) have been for business and institutional use. Of the institutions installing Prestel sets libraries, particularly public libraries, appear to be quite high on the list. Given that the Prestel set is likely to be in the library, what will be its effect and how will it relate to the other online services in the library.

Viewdata systems of which Britain's Prestel is one, aim to provide consultation of an information bank using telephone lines to link up with computers so that the information can be displayed on a television screen.

The content of the database differs from that provided by other online databases likely to be available within a library i.e. large machine-readable files of bibliographical records relating to books, articles in periodicals, patents, technical reports etc. that can be searched for references on subjects required by library users—MEDLARS, and online computerised cataloguing services such as OCLC which incidentally provide union catalogues of library holdings. The demarcation lines between these databases tend to be blurred as booklists can appear on Prestel and in the future Prestel technology is likely to provide the means of access to other databases. Nevertheless by providing 'hard' information, Prestel could either be in direct competition with traditional information services, or provide a means of enhancing these services. The Prestel database has been designed for the use of the general public and not for the specialist. Experience shows, however, that familiarity with the Prestel database is essential if the maximum benefit is to be achieved. So-called simplicity of subject headings and routeing from one piece of information to another, may not achieve adequate retrieval of information as any indexer or compiler of a large catalogue can confirm.

The results as yet incomplete of the monitoring of the DOI funded sets in the LASER Prestel Project give the following indications:

General comments

1. From the user point of view, Prestel's value is nothing more than the value of the information it contains, which is reduced by high perceived user charges and cumbersome access via poorly designed indexes.
2. Prestel offers a cheap and exciting new publishing medium, but people are generally ignorant of its potential.
3. Like TV generally, it is an opaque medium—i.e. when looking at any one screenful of information, the others to come or available for searching are not apparent, unless announced by indexes.
4. The small number of sets, particularly public access sets, has been a barrier between Prestel and its potential users. The 36 LASER sets constitute the majority of public access sets at present, although there are signs of change.
5. The siting of most of the first public access sets in libraries was valid, since these organizations offered enthusiasm; staff to monitor use; familiarity of staff with the information retrieval process; a wide variety of existing locations which a good cross section of the public already visit; a context in which Prestel could be seen as part of people's general information needs.

Usage

Most libraries report about 10 'real' searches a week, plus quite numerous demonstrations. This is felt to be a low figure, although comparable figures for other services are hard to obtain, and the numbers of people using the library varies very widely from place to place.

Equipment

Unfortunately no special Prestel sets other than the ISE coin-operated set exist for public use. Problems of security, durability, ease of use, etc. have arisen, although with librarian intermediaries, there have been few real problems for the public. Lack of good printers means greater expense while users copy information from the screen.

Public reaction

Most of the people who used Prestel during our monitoring were initially very pleased with it, and with expectations very high, some disappointment in about a third of cases was not surprising. Most consider Prestel's potential to be great. People are much more interested in how the system works and in who has editorial control than some commentators have tended to suggest. Most people insist on a general explanation of how it works before wanting to use it (the Dutch viewdata service, Viditel, recognizes this by giving users of coin-operated sets in Holland a free demonstration before charging begins). A demonstration was usually given by library staff in our trial. No charges were made to the public for any of the costs involved in using Prestel during our trial period.

Business demonstrations and use

Several sets were placed in specialist business library departments. Share prices, commodity prices and company news were very much appreciated by most of the business and reference library staff. There are problems in using Prestel for business purposes, of course, especially if the set is not on the businessman's desk but in a library.

Most business users have very specialised information requirements, and are not used to using public general reference libraries. By itself, Prestel cannot supply a full business information service, although where well-defined files of concise, frequently-updated information do exist, they can be promoted by any library. Opinions of staff differ dramatically as to whether Prestel is more or less used in a specialized business library than in a general reference or branch library.

Another problem seems to be the general lack of confidence by businessmen in public library services. Prestel cannot, by itself, improve this relationship, but may act as a catalyst. Small businesses, in particular, could, we feel, be greatly helped by services such as Prestel, and the DOI sets have been invaluable in enabling us to assess the problems in developing this area.

Although usage levels are still relatively low, at around 50 searches a month, the libraries involved are keen to continue using Prestel, awaiting development of its potential.

General Prestel use and demonstrations

Most of the DOI sets were placed in public reference libraries, although a dozen were in branch libraries. One was in a community centre and actively used by many local groups, three others were in the information centres of voluntary bodies. In all of these places, research results seem to be giving us similar information.

Prestel is, on the whole, popular unless lack of answers to questions produces disappointment. Some people, especially among those under 30, seem to prefer using Prestel to books. Overall, about ten searches a week are performed, satisfying two thirds of users to some extent. Even more demonstrations have been given. Students, professional people (especially teachers, local government staff and engineers) and the elderly are more likely to use existing reference and information services than other groups. Men are more likely to use them than women. Men often needed to use Prestel for their work, or for a hobby. Women do not yet find much of interest on Prestel, for their information requirements are often vague. They usually prefer a browsing medium such as a newspaper, or the radio. Consumer and welfare information seemed to be poorly used. This is no doubt partly because of lack of development of these services, but there is also a lack of expectation that libraries can satisfy requests for such information.

Large numbers of people (perhaps over 50,000) will have seen Prestel in a library over this research year, and most of these will have received full demonstrations. Publicity in each library depended on local conditions, but methods ranging from posters to newsletters, conferences, group demonstration sessions and local radio have all been used. Of all these, leaving a set with a frame, or sequences of frames showing was judged the most effective. Nothing is as effective as this actually seeing it in operation. By the present time, regular users are being noticed by staff in the libraries where Prestel has been longest established, and there is some evidence that it takes quite a while for people to become aware of what information can be obtained using Prestel, and for them to gain confidence in using the indexes.

Opinion of staff on Prestel as a library reference 'tool'

The comments on business and general use must be considered beside the opinions of staff about Prestel's value to them. The staff usually act as intermediaries, at least initially, in any search on Prestel, and it is their judgement which often therefore prevents people using Prestel, or guides them to it. Prestel only appeals when it speeds up, simplifies or replaces existing reference systems, otherwise traditional sources are preferred. In general, libraries found Prestel useful for its currency, the information available nowhere else, the timetables which were easier to use than printed ones, and the set itself as a publicity 'gimmick' and to attract new users to library services. The response facility was also useful for ordering directories and leaflets—this service is much appreciated, as this kind of pamphlet material is very difficult to trace usually. Prestel does not yet seem to replace any existing sources of information, and this is where criticism is harshest from library staff—they cannot afford simply to pay for an extra service when no savings can be made elswhere. Work on specific subjects area development could alleviate this problem, if it is done before enthusiasm wanes.

The library and information centre as an information provider

This last comment leads me into the other aspect of the library and information centres interest in Prestel—its use as a medium for the spread of information.

This aspect of Prestel has been looked at by LASER in its Research Project in relation to the design and indexing of a suitable databank structure for community information and the role of an umbrella organisation in the co-ordination and development of such a database.

An important use of the DOI sets in many libraries was to allow assessment of Prestel as a medium for community information provision. Many local authority departments, local and national voluntary organisations and especially libraries have been looking at experimental databases to discover whether they should provide information themselves, and if so, how.

By using the DOI sets and BLR and DD Research in this way we hope to develop a community information file on Prestel and match it to real needs. As the number of sets grows, so will the file, but money has been and will still need to be provided to break the vicious circle of no sets, so no willing information providers, so no good databases, so no sets. Having a few sets, and frames under LASER control has meant we have been able to experiment with indexing and presentation, and demonstrate Prestel's potential to prospective community information providers. The opinion of many involved in the work is that libraries and similar bodies will have a greater role as inputters than as users of Prestel when it develops a mass market, although by that time most libraries will have a set to check input and be as available as a telephone is today, as an extra vital resource.

Working under difficult conditions, with limited access to sets, library staff have created some excellent local files, which have been relatively well used already, despite the scarcity of sets—LASER has received over 13,000 frame accesses per month since October, 1980, or 0.5 per cent of the total accesses—and there were less than a thousand domestic sets in the whole country. Promising work is looking at local newsletters, a local shopping experiment for the handicapped and disabled, what's on guides, local statistics, press releases from the National Council for One Parent Families and so on.

The overall mood seems to be of great interest, tempered by uncertainty about user needs, input costs and staff requirements and the future growth of set registrations.

LASER has identified the need to match information on Prestel with real needs and this parallels the research results carried out by British Telecom.

At the recent Prestel Marketing meeting British Telecom admitted that the earlier assumption on which Prestel marketing decisions had been made were wrong—a general encyclopaedic database which would sell itself through conventional retail outlets.

British Telecom now propose a new approach:

1. Identify specific markets
2. Identify specific benefits within those markets
3. Sell to specific markets where immediate benefits can be identified.

Classic sectors are:

1. Travel
2. Commodities
3. Investment general
4. Property investment

Promising sectors are:

1. Agriculture
2. Paper
3. Closed user groups
4. Foreign Exchange
5. Construction industry
6. Hotels
7. Law
8. Affluent residents

There are those of us, however, that believe that Prestel has an important role to undertake in the dispensing of social information which will increase in importance as Prestel sets move into the domestic sector of the economy.

To promote this role a group called the Social Information Providers Group has been set up of which LASER is a member. Other members are:

National Consumer Council
Consumers' Association
Health Education Council
National Association of Citizens' Advice Bureaux
Central Office of Information
Council for Educational Technology
Department of Health and Social Security
Office of Fair Trading
Library Association
Aslib

The aims and objectives of the Group are:

1. To explore and develop opportunities offered by Prestel for increasing access to social information.
2. To influence, where possible, the development of the system as a nationwide, user-orientated service, paying special attention to the information needs of the more disadvantaged user.
3. To make representations on behalf of social information providers on any issues concerned with the provision of social information on Prestel to government, British Telecom and industry, as appropriate.
4. To share experience and knowledge in developing Prestel as a social information medium.

The Group is making representations to government at a very high level and is trying to organize further research in this field which will develop that already carried out by Aslib and LASER. It is also looking at the joint production of hard-copy directories to the information on Prestel in the 'social' sector.

There is still a long way to go and if I had to sum up the LASER involvement in Prestel I would say that it is still an act of faith. The future is still uncertain—Prestel is not likely to experience sudden growth in the next twelve months but it could wither and perhaps die. Personally I believe the potential is such that we must aim to keep it alive.

Effect of online services on purchases of a printed index

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This paper reviews the trend of purchasing of a printed index (Index Medicus) within one regional health authority. It shows that as the machine readable counterpart (Medline) has become more easily accessible the purchase and use of Index Medicus has increased rather than diminished.

Background

THE SOUTH WEST THAMES REGIONAL HEALTH AUTHORITY comprises fourteen health care districts in Surrey, West Sussex and South West London. Each district has either one or two medical libraries providing information services to doctors and other health care professionals. *Index Medicus* is the major bibliographical tool appropriate to these libraries but local policies have varied from total non-purchase to purchase of all three versions—the Abridged, the Monthly and the Cumulated.

In 1976 a Regional Librarian was appointed to develop, co-ordinate and rationalise the service, but budgets and stock selection have continued to be locally determined. Other dates of importance to this study are 1963 when the first postgraduate centres, where the libraries in this study are based, were set up; 1968 when UK Medlars became available and 1979 when the Regional Health Authority took out a Blaise subscription and offered free online searching to all health staff in the region.

The region has three terminals based in the postgraduate centre medical libraries at Chichester, Croydon and Guildford. These provide a search service for all the libraries in the region, contact being made either by phone or letter. A fourth terminal is available at the teaching hospital, St George's.

Survey

All twenty postgraduate centre medical libraries in the region, based in both general and psychiatric hospitals, took part in the survey. They were given a short simple questionnaire to complete (Fig. 1.) There was a 100% response, all replies being received within two weeks of sending out the questionnaire.

Results and discussion

All the libraries in the region took, or had taken, some version of *Index Medicus* except for three small, psychiatric libraries for whom *Index Medicus* is not the most useful tool (Fig. 2.)

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Please tick the appropriate columns. There is room for further comments.

1a *Have you* ever *taken Index Medicus (IM)*

	No	*Yes*
Abridged IM		
Monthly IM		
Cumulated IM		

1b *If your answer to (1a) is YES please give the starting date and if you have subsequently ceased taking it, the cancellation date.*

	Starting date	*Cancellation date*
Abridged IM		
Monthly IM		
Cumulated IM		

2 *Has your decision to START/RETAIN/CANCEL Index Medicus been influenced by the availability of* Medlars *and* Medline?

		No	*Yes*	*Comments*
Abridged IM				
	Start			
	Retain			
	Cancel			
Monthly IM				
	Start			
	Retain			
	Cancel			
Cumulated				
	Start			
	Retain			
	Cancel			

3 *Has the availability of* Medlars *and* Medline *affected the way you use Index Medicus?*

	No	*Yes*	*Comments*
Abridged IM			
Monthly IM			
Cumulated IM			

4 *Any further comments you would care to make.*

FIG. 1 *Index Medicus v Medline Questionnaire*

Index Medicus	*Number of libraries which have ever taken Index Medicus*		
	Never taken	*Once taken but discontinued*	*Currently taking*
Abridged	18	2	0
Monthly	11	2	7
Cumulated	3	1	16

Total number of libraries = 20

FIG. 2. *Number of Libraries which have ever taken Index Medicus*

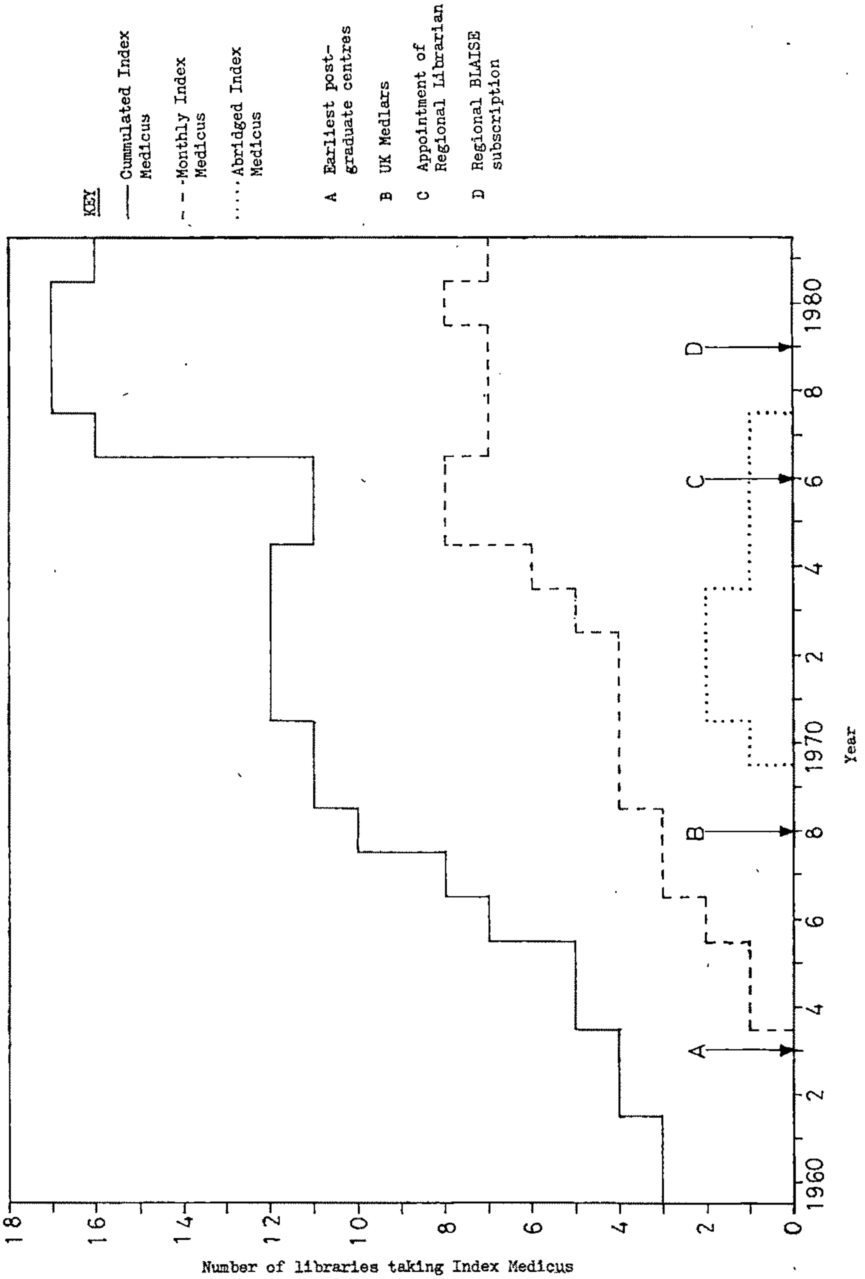

FIG. 3. *Number of libraries taking Index Medicus—1960 to 1981*

The most popular version was *Cumulated Index Medicus*, either on its own (7 libraries) or in combination with *Monthly Index Medicus* (8 libraries). There has been a consistent increase in the purchase of *Index Medicus* over the period 1960 to 1981. (Fig. 3). It might be thought that the setting up of postgraduate centres and the appointment of a regional librarian would have a positive effect on the purchase of *Index Medicus* whilst the availability of the computerized database, firstly through the UK Medlars Service and secondly through the taking out of a Blaise subscription in the region, would have a negative effect. Because of the small numbers involved and the uncertainty over the length of the lag period between the stimulus and the response it is difficult to draw any firm conclusions from Fig. 3. If there is no evidence for a positive response there is certainly no evidence for a negative one.

The results from questions 2 and 3 are more illuminating (Fig. 1.) The availability of Medline only affected the purchase of *Index Medicus* in one case, at one of the libraries with a terminal. *Monthly Index Medicus* was cancelled as SDIline was considered to be easier to use, cheaper and more up to date. *Cumulated Index Medicus* was retained to assist in search formulation for Medline. Two other reasons given for purchase decisions were:

(a) cancellation of *Cumulated Index Medicus* because of lack of funds at district level

and

(b) cancellation of *Abridged Index Medicus* in favour of the Cumulated version.

	Index Medicus	
	Monthly	*Cumulated*
Number of libraries with subscriptions	7	16
Number unaffected	3	8
Number affected	4	8
*Effect: Decreased use	2	1
Increased use	1	3
Change in character of use	2	7

Total number of libraries 16

* The numbers in the columns add up to more than the total as many libraries saw both an increased use and a change in the character of use.

FIG. 4. *The effect of the availability of Medlars and Medline on the use of Index Medicus*

The availability of Medline affected the use of *Cumulated Index Medicus* in 16 libraries with *Index Medicus* (Fig. 4), but in most the effect was a positive one i.e. an increased use or change in use of *Index Medicus*. In the libraries with terminals *Index Medicus* was used for search formulation and to carry out an initial search before using Medline. 'I very seldom try Medline before *I.M.*' In one case the presence of Medline had improved the use of *Index Medicus* as 'Medline has taught me how to use MeSH properly'. There had also been an increase in manual searching. 'I think the presence of Medline has enhanced the use of the printed indexes.'

At the libraries without terminals a similar picture emerged. Searches were checked in *Index Medicus* before requesting a Medline search and *Index Medicus* was used 'more carefully' and 'more frequently.' Very involved or long searches were preferentially done on Medline rather than *Index Medicus*, but for simple searches these libraries found that *Index Medicus* was convenient and cheap. In fact it was more *online* than Medline because of having to request Medline searches from other libraries and because of the delay for offline prints. Only one library saw a negative effect. 'Time can be saved by referring immediately to a computer terminal a search which at a glance is obviously more suitable for Medline.'

All the above comments referred to *Cumulated Index Medicus*. In the case of *Monthly Index Medicus* 2 out of 4 libraries with subscriptions felt that the availability of Medline affected its use (Fig. 4.) This effect appeared to be a negative one, 2 librarians seeing a decrease in the use of *Monthly Index Medicus* as SDIline was considered to be quicker to use and more up to date. One of the librarians with a terminal would consider cancelling *Monthly Index Medicus* if money became tight, though only because the terminal was on site.

What came over quite clearly in the comments made both by librarians with terminals and by those without was that the nature of the search had most influence on the decision to use the printed or computerized version of *Index Medicus*. This is illustrated by the following quotes:

'In our library Medline will probably not replace I.M. for some time to come. I.M. will probably always be used by students to hunt out information for their essays and projects. The way they search is to "browse"—one thing leading to another—and Medline cannot perform this function at present.' (From a librarian with a terminal.)

'Use of Medline over manual searching is dependent more on the nature of the query i.e. diverse aspects better brought together by the computer.' 'We would in any case find *Cumulated Index Medicus* very useful and cost effective for straightforward searches.' (From librarians without terminals.)

Index Medicus is seen as a handy tool for short, straightforward searches or for browsing whilst Medline copes better with long and complicated searches. As one librarian said:

'I've always regarded Medlars/Medline as being complementary to printed *I.M.* rather than a replacement.'

Index Medicus is also a very versatile useful tool:

'*Index Medicus* has many different uses for me in the library. I use it for subject headings, serials indexed, authors names etc. and as an immediately accessible bibliography.' 'I should think it would be a very long time before Medline would supplant *I.M.*'

The librarians in our sample, both with and without terminals, concur in seeing the two searching systems as being appropriate to different types of search.[1] This could call into question the value of direct cost comparisons, or even cost-effectiveness comparisons, between the manual and online versions of a database.[2]

Special factors

The impact of online services on the purchase of printed indexes within this regional library service may be untypical. On the one hand it may be argued that these results are affected by the growth of the library service in the region and the admitted pressure of the Regional Librarian on librarians to buy *Index Medicus*. On the other hand, as library budgets are locally determined and spent, whereas the Medline service comes from a Regional budget, this would favour non-purchase or cancellation of *Index Medicus*. In favour of the validity of the result is the similarity of the findings from the libraries with terminals and from those without. This finding may be peculiar to *Index Medicus* which is relatively inexpensive and easy to use compared with tools such as *Chemical Abstracts*. This may make it less vulnerable to competition from its own online version.

Conclusions

Much concern has been expressed in recent years over the effects of online services on the sales and use of printed bibliographies. If people cease buying the printed bibliography in favour of the online version then the producers must drastically increase online costs to the detriment of both themselves and their users.[3,4] However in our study of the use of *Index Medicus* and Medline in our region we have found that the availability of Medline has not adversely affected the purchase and use of *Index Medicus*. The purchase of *Index Medicus* has continued to rise and the availability of Medline has in fact had a positive effect on its use.

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Teaching the use of information resources (TUIR) and the schools of librarianship

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Replies to a short questionnaire sent to the 18 schools of librarianship and information studies in the British Isles indicate that most schools include short or long units on teaching the use of information resources in their courses, or integrate TUIR into broader subject areas. Arguments for and against TUIR are noted. The future development of TUIR may lie in the wider area of cooperation in the development of independent learning skills.

Introduction

SCHOOLS OF LIBRARIANSHIP and information studies are intended to provide the foundations of good theory and practice upon which students can build throughout their subsequent professional careers. Most schools offer some variant of the core curriculum, information retrieval, information resources and services, and management of information, under many different names. Numerous optional courses are also offered.

Three major constraints affect schools of librarianship in their choice of courses. Firstly, no school could offer all useful subjects in the time available for a foundation course. Any subject offered in a foundation course must therefore justify its place. Secondly, the views of the profession at large must be considered; there should be at least some correlation between the profession and the work done in the schools, though the schools are expected to be innovators. Thirdly, any course offered must be acceptable to the institution of which the school is a part. No school may offer a course without necessary approval to use the human and material resources required.

User education, or Teaching the use of information resources (TUIR), comprises two main areas: firstly, general instruction in the use of library facilities and secondly, introduction to systematic use of resources in users' own fields. The user learns that there is a pattern of information: general reference tools; lists, such as catalogues and bibliographies; and access tools to subject content, such as indexing services, abstracting services, current awareness services, indexes to theses, to conferences, special collections and the like. Most users do not require regular access to sources of information, whether in print, media, or in computerized form. Many prefer to work through an intermediary. It would have to be determined to what depth TUIR is necessary in any given circumstances.

TUIR has not achieved status as a core subject. There is considerable debate. Lester[1], Smith[2], Wilson[3], consider it of secondary importance, even outside the province of the library, a matter better dealt with by others. Crossley[4], Finn[5], Hughes[6], consider it essential practice. Breivik[7], Galloway[8], Stanton[9], discuss TUIR in the context of the

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schools of librarianship. Crossley[4], Galloway[8], and Stevenson[10] emphasize the need for schools of librarianship to teach librarians how to teach.

The results of the questionnaire

To teach librarians how to explain to users how to use information resources requires firstly knowledge of users and their information seeking behaviours; secondly, thorough knowledge of the literature of a relevant subject area; and thirdly, some understanding of educational theory and practice in this context. Direct, face-to-face teaching methods, and also indirect methods are considered in TUIR.

To find out the opinion and practice of TUIR in schools of librarianship in the British Isles, a short questionnaire was sent to the 18 institutions. Replies were received from 15 (83 per cent). In the field of library and information work some of the schools offer undergraduate courses only, some postgraduate only, and some have varied mixtures of undergraduate, postgraduate, higher degrees; and certificate courses in the school library field. Most courses are full time, but some are for part time study.

Ten of the schools provide areas of study in TUIR, under various names, with time allocation varying from one hour to 45 hours. Four of the schools treat TUIR as a pervasive topic, to be considered when appropriate in media courses, work with children, cataloguing, reference, management and so on. One school allots part of a general lecture to TUIR. In each of these schools TUIR occurs in all courses relevant to that institution, at the various levels. Three schools mention short courses in TUIR.

TABLE 1. *Allotment of time to TUIR, in each relevant course*

Lecture, part of a lecture, lecture plus seminar	3 schools
2–4 week unit	6
integrated into all subject areas	4
case study plus discussion	1
20 hours for undergraduates, 8 hours for postgraduates	1
longer options	5

Two options use 45 hours, over 15 weeks. These options occur in the part time BA course for people who hold the two year professional qualification, and are proceeding to a degree. One option is called *Library promotion*, which includes 'quite a lot of user education'. The other option called *Teaching the use of information resources* is based on the systems method of teaching, and involves considerable participation and practical work (Apted[11]). Students on these courses are mature practitioners of some seniority.

TABLE 2. *Subject areas responsible for the TUIR element in courses*

Management area	5 schools
Information resources and services	1
Cooperation between management and IRS	4
Other	1
Not recorded	4

Teaching methods used

As would be expected there is great variety in teaching methods used, even in individual schools, because of the differing approaches used by different teachers.

TABLE 3. *Teaching methods used*

Lecture, lecture with seminar	3 schools
Lecture, seminar, multi media	6
Practical workshops, planning practice, visits, teaching practice, lectures and seminars	5
Case study plus discussion	1

The longer courses use a wide variety of teaching methods. For example, in one school postgraduates who take the education libraries option conduct sessions in the use of information resources for children in a nearby comprehensive school. Another school requires students to prepare a teaching guide to a subject area of their choice, for users of their choice. One school devotes 12 hours to public speaking and the use of audio visual media. A specialist study called 'Media librarianship and educational technology' devotes about half the course to TUIR. Most students produce media presentations as assessed work, and some of these presentations 'are currently in use in user education programmes in college and polytechnic libraries'. TUIR can be the subject of students' assessed projects and dissertations, if they choose, as eight schools noted. One school gives students the feel of TUIR by attending 'library instruction at the local university library, just as if they were freshers on an induction course'. Each honours student at one school is required to carry out a cooperative study with a student in another discipline concerning the literature of that field. In this way students in other disciplines are informally taught to use their relevant literature.

TABLE 4. *Respondents were asked if their school of librarianship had any part in TUIR in their own institution, apart from teaching*

TUIR is done entirely by professional staff in the institution's library	8 schools
All TUIR in Business studies and accountancy, and in Art and design, is done by the school	1
Formal programme of cooperation between the institution's library and the school	2
Training sessions for library staff	1
Special courses arranged on request	4
Participation in the institution's programme for preparing higher degree students for research	3

Other related activities

Research on TUIR with particular reference to patents, and to nursing, is currently being undertaken in one school of librarianship. Two schools said that a representative of the institution's library is actively involved with development of the school's courses, by being a member of the Board of Studies.

Arguments for integration of TUIR within the whole syllabus rather than having a separate course or unit

Some schools argue the case for treating TUIR as a pervasive theme, represented in all courses, but not taught as a subject in its own right. One respondent writes 'There are some specific lectures and seminars in different parts of the course, for example, user education in schools and children's libraries appears in option courses on children's work. The use of audio visual media in education appears in the non book media option, and in core courses. User education also appears in the context of reference and information work, and in courses dealing with on-line services. In most cases at least one lecture and seminar would be devoted to it, but in other cases user education is fused on to the whole curriculum.'

Another reply expresses similar views 'cataloguers will worry about how to persuade people to use their catalogues; reference librarians will look for ways to increase knowlege of sources'.

Arguments against TUIR

Three respondents made adverse statements. One said 'I, personally, am sceptical of the value of much user education'. Two people expressed strong views. One said 'User education is an over rated bandwagon subject, popular with librarians who have insufficient imagination to think of anything better'. The second said 'Librarians seem to have a remarkable propensity for leaping with great enthusiasm upon every passing bandwagon. User education is expensive, and in times of great financial constraint every penny needs to be spent effectively, and accounted for carefully in ways which will withstand hostile examination by the library paymasters. It is therefore sensible to insert notes of caution or even downright cynicism into the prevailing euphoria, in case the proposition "everyone knows that user education is a good thing" meets with the response from the paymasters "We do not. Explain, quantify, justify" '.

Arguments for TUIR

The other twelve respondents were in favour of TUIR. Three examples of comments and suggestions follow.

'I think perhaps that the only way in which user education can be properly dealt with is by in-depth consideration of the topic, allowing for lectures, seminars, visits, and practical projects. Even a four term course does not enable enough time to be given to the topic—and it is important. Possibly an option dealing specifically with user education would be the best approach'.

'Good library publicity and clear guiding of our libraries would eliminate much of the "garbage" included in user education programmes, such as rules and regulations, how to find Dewey sections and the like. User education presupposes a clear perception of users' needs, their needs, not our supposition of their needs, and a sound grasp of educational aims, objectives and practice. So we need to give students some educational theory, a grounding in educational technology theory for example, and the skills for instructing and explaining. The traditions of user education resulted in stereotyped programmes covering mainly locational skills. I feel that the cognitive skills needed for gathering, selecting, processing and using information are under exploited. Using books and libraries effectively rests upon cognitive abilities rather than manual or spatial ones'.

Another respondent said that TUIR is 'an obvious area where teaching of theory in schools of librarianship can help students later on in practical situations'.

TUIR outside the educational library setting

One respondent teaches a course in public library management. 'Discussion is at a different level than that in academic library or special library options. We are concerned to describe attempts to introduce user education programmes in this country, to comment on American and other experience, and to stimulate thought as to the role of such programmes'.

Future development of TUIR?

Hatt[12] discusses developments in the field of independent learning, of which TUIR is a component. Many students in all subjects, and at all levels of study, need guidance in study methods generally, and in related library based independent learning skills. Wood[13] emphasizes that understanding search strategy and the workings of the information system of a subject helps students to acquire the idea of the nature of information problems and how to deal with them. Citizens need to know how to find their way through the information jungle. It may be that the future development of TUIR lies in the wider area of cooperation in the development of independent learning skills.

ACKNOWLEDGEMENT

I should like to thank all colleagues in the schools of librarianship who so helpfully answered my enquiry.

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The IAP Library at King Abdulaziz International Airport

George McMurdo
IAP Library, King Abdulaziz International Airport

The scope and activities of the library of the International Airports Projects (IAP) office of the Ministry of Defence and Aviation, Kingdom of Saudi Arabia, are described. The IAP Library has favoured the application of technology-intensive techniques, including the development of a computerised Library Administration System (LAS), which makes use of UK and LC MARC tapes. Future developments may include interfacing with a computer-indexed automated microfiche retrieval system. It is suggested that library and information provision in Saudi Arabia may be entering a period of rapid expansion.

1. King Abdulaziz International Airport

ON 12 APRIL 1981, HM King Khalid bin Abdulaziz dedicated the new King Abdulaziz International Airport at Jeddah, Kingdom of Saudi Arabia. The new airport, named after the late King Abdulaziz bin Abdul-Rahman Al-Saud, founder of Saudi Arabia, is a vast structure capable of handling 10 million passengers per year, a figure expected to develop by the year 2000. KAIA is one of three gateway airports being planned and built under the direction of the International Airports Projects (IAP) office, formed in 1976 as an arm of the Ministry of Defence and Aviation. In addition to King Abdulaziz International, IAP is building a new airport at Riyadh, the fast-growing capital city of Saudi Arabia, and is planning a third international airport near Dhahran on the Arabian Gulf, to serve the Eastern Province.

The facilities being designed and constructed within this development program—most notably perhaps the striking tent-like structure of the Haj Terminal at Jeddah—have already been the subject of international comment in the architectural, engineering, and airport literature.[1-16] KAIA has been described as one of the outstanding engineering and architectural construction projects of our time. It is not only physically large, covering approximately 105 square kilometres, but is also unique amongst the world's airports in the wide variety of functions it performs. KAIA is effectively a complete new city with its own infrastructure, including utility plants, medical facilities, housing facilities, a telephone system, water-supply, waste-water treatment plant, a security force, and even a horticultural nursery.

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2. The IAP Library

(a) Introduction

The same diversity of function which characterizes KAIA is reflected in the scope of the International Airports Projects Library, developed to provide information support for the design, construction, operation, and maintenance efforts of the IAP airport development program. Whereas in the UK or US, libraries supporting aviation and airport-related activities exhibit a fragmentation of scope—since regulatory bodies, carriers, and airport authorities tend to maintain their own separate libraries—at KAIA these distinctions are less emphasized and the demands of the user population are highly varied. An equally significant parallel between the IAP library and the body it serves exists in the application of state-of-the art technology. From its inception in 1979, the overriding management philosophy of the library has been that, whenever possible, a technology intensive approach should be preferred over a labour intensive approach.

(b) The Physical library area

During the first phase of development, pending determination of long-term user requirements, the library has been installed in an area of 650 square metres, including office and workroom space. The configuration of the library interior, bookshelving, periodical shelving, etc, is geared to accommodate a maximum stock of about 100,000 monograph items and 600 periodical titles. Forty reader-spaces are provided, plus of course, a library counter.

(c) Stock

Naturally, the primary concentration of stock is in airport and civil aviation related subjects. Complete sets of publications of bodies such as the Airport Operators Council International, Civil Aviation Authority, Federal Aviation Administration, International Civil Aviation Organization, Institut du Transport Aerien, etc, are held. However, the wide range of skills and disciplines which contribute to the construction, operation, and maintenance of an international airport are evidenced by the extensive range of secondary subjects which are also represented in the IAP Library's stock. Examination of the bookstock, for example, reveals very few total gaps in the Dewey classified sequence, with the exception perhaps of the literature and history sections.

The library is committed to the exploitation of microforms. Much report literature is obviously acquired on microfiche, and, in addition the library subscribes to a service which makes a comprehensive range of UK, US, and international standards, specifications, and product literature available on 16 mm microfilm cartridges. The microform option will also be taken up when backruns of periodicals pose excessive storage demands.

The periodicals collection parallels the subject distribution of the bookstock, so that in addition to airport engineering and operation-related titles, such diverse subjects as Data Processing, Education, Fire Prevention, Graphic Art, Insurance, Law, Library Science, Management, Medicine, Micrographics, Psychology, Public Administration, Purchasing, and Training are covered. Although costing studies have been made with a view to future exploitation of periodical literature by means of online searches of Euronet DIANE, DIALOG, and ORBIT, in the short term dial-up access will not be made available to users. Consequently, the library attempts to provide a good range of basic hard-copy secondary sources. Coverage includes *Applied Science and Technology Index, Architectural Periodicals Index, British Technology Index, Computer and Control Abstracts, Engineering Index, Government Reports Announcements and Index, Index Medicus, International Aerospace Abstracts, Library and Information Science Abstracts, R and D Abstracts*, and *Scientific and Technical Aerospace Reports*. (Of these bibliographic tools, *Engineering Index* is the service most closely approximating to the library's scope and a COMPENDEX evaluation package has been obtained to assess the feasibility of providing in-house literature searches and SDI services using leased tapes.) The on-site periodicals collection is supplemented as necessary by an inter-library loan service based on the International Lending Section of the British Library Lending Division.

(d) Systems

The IAP Library's book-ordering, cataloguing, subject-indexing, circulation-control, overdues, and reservations functions are served by a computerized Library Administration System (LAS). The basis of the LAS is an Order file, Catalogue file, Index file, and User file all of which are maintained on online disk storage on the ADABAS database management system.[17] The LAS shares time on IAP'S IBM 370/148 and 3031 which run together, currently with 2 megabytes of core. For ordering and cataloguing functions, bibliographic data is automatically read into the LAS from a batch-processed MARC file. BLAISE supplies the library with both the UK weekly MARC exchange tapes and the reformatted LC weekly tapes. Complete retrospective files of both UK and LC tapes are maintained.

Cataloguing of extra-MARC material is fully online, though to a simplified local format, rather than full MARC. Cataloguing practice employs a modified form of AACR2. Dewey Decimal Classification numbers from the 19th edition of the scheme are used, manually upgrading 18th edition numbers retrieved from the retrospective MARC file where number-changes have occurred.

At the time of writing the periodical section receives no computer support, although heavy reliance is placed on word processing equipment for the maintenance and production of alphabetical and subject listings. Ordering and receipt of periodicals, and a selective current awareness service, are carried out on a manual basis. However, a system is in the design stages which will provide an online search facility, retrieving airport-related references from a bibliographic database file maintained by the library. This system—tentatively designated IAP2 (*I*nternational *A*irports *P*rojects *I*ndex to *A*irports *P*eriodicals)—will also generate a monthly bulletin of current airport literature.

(e) Staffing

The present establishment of the library includes four professional positions and five library assistant positions. As mentioned above, the overriding philosophy of the library favours technology-intensiveness rather than labour-intensiveness. However, as user-services are expanded there will inevitably be pressure to raise staffing levels.

(f) IAP Document Control System

Perhaps the most interesting potential development facing the IAP Library is the possibility of interfacing the functions of the library with the IAP Document Control

System (DCS). This state-of-the-art document retrieval system comprises a computer-index, computer-driven, automated microfiche retrieval system. Documents are input by means of computerized image scanners which initially transfer digitized representations onto disk storage for review and indexing. Retained documents are subsequently COM printed on microfiche. Document access is via remote online CRT terminals receiving a video-digital display of frames from centrally located, machine retrieved microfiche. (The basic characteristics of this type of system and its possibilities in library applications have been described earlier by the writer.)[18] One proposal under consideration at the present time is to COM produce the IAP Library's catalogue listings on DCS-compatible microfiche for remote online searching. For the classified sequence, retrieval would initially be by entry of a DDC number, thereafter upgrading to offer the option of retrieving via combined-keyterm searches of headings in the LAS's online Index file. For the alphabetical sequence, individual microfiche frames would be indexed by their alphabetical range, allowing retrieval based on a LESS-THAN and GREATER-THAN strategy in response to a user-entered value. The number of characters thus entered would permit the user to control the specificity of his search in a totally natural way. Note that this fairly simple expediency overcomes the traditional problem of online library catalogues where attempts to reproduce conventional full-title access face difficulties, trading-off the impracticality of expecting users to accurately enter large strings of alphanumeric and punctuation characters for an exact match, the extensive online storage needed to store cataloguing data and maintain inverted lists, and the software development costs of trying to provide the same vital redundancy that a simple alphabetical listing affords the user in this type of human information processing task. (An existing version of this proposal, using simplified hardware, is described by Hayes and Borko[19] who have utilized a stand-alone automated microfiche unit in which a microfiche storage carousel is located within the unit.)

3. Conclusion

The IAP Library, like IAP and the Kingdom of Saudi Arabia itself, faces an intriguing and challenging future. Bibliographic control and information services in Saudi Arabia are still in the early stages of development compared with the majority of the acknowledged member-countries of the library world. However, progress is under way, and if the Kingdom's rate of progress in the industrial sphere is any guideline, Saudi Arabia may be expected to make up ground very rapidly. While at the present time there is no national bibliography, on the information side the Saudi Arabian National Center for Science and Technology is developing a Scientific and Technical Information System which will gather data about Saudi libraries and information centres with a view to coordinating national information provision. Furthermore, any observer familiar with the library literature will already have detected the increasing number of publications either emanating from Saudi Arabia itself, or describing services within the Kingdom.[20-26]

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The work of the Aslib Research Department

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Division

This paper was originally prepared for presentation to the British Library's Advisory Committee for the Research and Development Department on 8 May 1981

Introduction

THE PURPOSE OF this paper is to review recent and current work of the Aslib Research and Consultancy Division, with special emphasis on its research funded by the British Library Research and Development Department (BLRDD). In particular, the aim is to explain why we do the work we do, and to bring out its essentially practical nature.

The *raison d'etre* of this part of Aslib is a mixed one. We do research mainly in an attempt to solve certain identifiable problems in information management. We do it also because it enables us to maintain a pool of expertise that is needed to sustain other Aslib activities. Consultancy is the main one, of course, but research staff also provide an important source of ideas and support for training courses, conferences and meetings, and publications activities.

Based as we are within an organization set up to provide useful services to its members, we are particularly conscious of the need to do research projects that will also be regarded as useful by the members—and by the library and information worker community at large, since we want them to buy (and benefit from) our reports! It is also vitally important that our research programme should be forward-looking—not totally preoccupied with the problems of today's special libraries and information units, but anticipating and preparing to help with the problems of the future.

The Research Programme

The framework for our BLRDD-funded research is that shown in the programme submitted in support of our most recent grant application (April 1979). Six main areas of work were envisaged:

1. National information policy.
2. Information management within organizations.
3. Applications of new techniques.
4. Evaluation methods.
5. Evaluation of services and products.
6. Education and training.

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The detailed content of the programme is influenced by various factors. For a start, ideas for projects originate in several different ways. Some come from the research staff themselves, who have their particular areas of interest and expertise. Some are stimulated by consultancy experience, which highlights common problems in the world outside. Others originate from BLRDD. Some are of mixed origin. To illustrate this, the list of recent and current projects which is appended gives a brief note of the origin in each case.

National Information Policy

Turning now to the current programme of work, this first heading is a convenient one under which to group projects considered to be of national or general value, rather than of immediate benefit to individual organizations.

A preliminary study, in 1979, of manpower forecasting and planning practices in other professions showed the library/information profession to be ill-equipped in this field. Scope for several useful research projects was identified.

One such project, since completed, was designed to establish staff-to-user ratios for industrial and commercial library/information services. A survey was carried out, which not only looked at existing ratios, according to careful definitions of different levels of 'staff' and 'user', but also investigated ideal ratios as suggested by managers of libraries and information units. The data resulting from this survey will undoubtedly be of direct value to those concerned with manpower planning at the national level, or with manning at the organizational level. The information it has produced on the factors affecting staff-to-user ratios, and on the potential effects of automation on staffing, should be of even wider interest.

Information management within organizations

This area of work is strongly influenced by consultancy experience, which over the years has made us very aware that the most serious organizational information problems are often quite unconnected with the technical information facilities that have been our traditional concern. A key project in this category aims to investigate common problems of documentary information transfer, storage and retrieval in industrial organizations. Preliminary results support our view that common patterns of information flow, closely related to types of organizational structure, can be identified; and that common problems are experienced with information systems relating to various functions. This project is an exploratory one, which should open up new fields for research relating to information systems in industry. The results should eventually be of interest and value to industrial management, as well as information workers.

Another major project that fits best under this heading is one on non-use of information. It is concerned with the problem of why library and information services in industry and commerce are so often not fully utilized. A preliminary study confirmed our belief that this is regarded as a real problem by many managers of libraries and information units. The main project aims to locate, identify, describe and understand both non-users and misusers of these services—particularly in terms of their needs and wants, work content and style, and their reasons for non-use of available resources.

Application of new techniques

The Aslib Research Department has always sought opportunities for its researchers to familiarize themselves with new techniques (which usually imply new technology). In recent times, we have been actively involved in two important new areas of technology—viewdata and microcomputers.

Two concurrent projects on viewdata were started in 1978. One was designed to assess the impact of Prestel on public library reference services from the viewpoint of the users and the library staff. Six public libraries participated in the original study, which was completed in 1980. It was then extended to 7 branch libraries, to investigate the usefulness of Prestel in libraries with only limited reference collections.

The other viewdata project aimed to explore the provision and use of community information on Prestel. Public libraries in six local authorities supplied local community information, which the research team used to create and maintain a set of databases, using about 8000 frames. Because of the disappointingly slow growth in the number of receivers installed, assessment of the perceived value of such information by users was restricted, but valuable experience was gained in the techniques of converting community information into Prestel format.

Our main microcomputer project should really appear under the *Education and Training* heading, because its true purpose is concerned with educating the information users of the future. More specifically its aims are (a) to develop and test a microcomputer-based information retrieval system for use in secondary schools, which children can use to find information relevant to their class work; and (b) to evaluate the system as a means of demonstrating and teaching the basic principles of information storage and retrieval. The system (ie the software, hardware and an experimental database) has already been installed in four schools and the evaluation is beginning.

Evaluation methods

This is another heading under which we can claim considerable past experience, but it is important that we should continually add to and refresh that experience. Fortunately, ample opportunities are provided through consultancy work as well as research.

Our current research project under this heading aims to develop and test a set of self-evaluation methods that could be used without external help in industrial special libraries. In other words, we are trying to develop a DIY evaluation kit (or kits) that will enable library/information unit managers to assess the performance and efficiency of their services. The first step will be to collect views on the most important parameters to be evaluated; suitable techniques will then be chosen and tested for their suitability to these conditions.

Evaluation of services and products

We have no current (BLRDD-funded) work under this heading, but last year completed an assessment of information services provided to local government officials and others by Leicestershire Libraries and Information Services. The project was of particular interest in that the researcher (John Martyn) devised a simple but convincing way of deriving and indicating the value of each service as perceived by the users.

Education and training

Allegations of mismatch, between the output of library-information schools and the needs of operating library-information units, have been voiced incidentally by respondents in research projects concerned with other topics. A project has recently been started which will attempt to answer several questions in this area. Is the criticism justified? If so, what is the extent and nature of the mismatch? What should be done to bring employer and academic objectives into closer alignment?

Finally, a project which fits under this heading if its scope is extended a little to include promotion of use. This was an investigation of the feasibility of setting up, in the United Kingdom, a national graphics resource centre for libraries. The role of such a centre, as seen in many other countries, would be to design, mass-produce and market a range of graphic materials, the underlying purpose of which would be to enhance the image of libraries and encourage their use.

Conclusion

In a few pages it has been possible only to sketch the outline of ten projects, any one of which could be the subject of a paper in its own right. Our purpose will have been served, however, if this paper has shown the variety and scope of the work undertaken, and at the same indicated its utility and relevance to the library/information community, and to the organizations they serve.

APPENDIX

List of current and recent projects funded by BLRDD

Title	*Origin*
Current work	
Impact of viewdata on public library reference activities (Phase 2)	BLRDD
Potential of viewdata as a conveyor of community information (Phase 2)	BLRDD
Non-users of industrial/commercial library/information services	Aslib R and C
Dissemination of research results to library and information science practitioners	BLRDD
Common problems of documentary information transfer, storage and retrieval in industrial organizations	Aslib R and C
Information retrieval and microcomputers in secondary schools	BLRDD
Comparison of library school and employer objectives	Aslib R and C
Self-evaluation methods for special libraries	Aslib R and C
Production of a unified list of references from on-line search of a set of secondary services	Aslib R and C
Recently completed work (1980-81)	
Librarian/information worker: user ratios	Aslib R and C
Assessment of Leicestershire information services for local government	BLRDD
Evaluation of agricultural seminars	BLRDD
Impact of new technologies: implications for library and information work manpower planning in the UK	Aslib R and C
National graphics resource centre for libraries in the UK	Aslib R and C

Letter to the editor

UNIVERSAL DECIMAL CLASSIFICATION

I refer to the last two paragraphs of the paper prepared by Aslib entitled 'Activities of the Commission of the European Communities' and published in the March 1981 issue of *Aslib Proceedings*.[1]

It seems illogical to me that the information experts of the Commission of the European Communities should totally ignore the existence of the Universal Decimal Classification the use of which in an international environment brings benefits to all concerned.

I am sure that many users of the Universal Decimal Classification in industry, commerce, government and education throughout the Communities and elsewhere in the world would be most grateful should the Commission initiate early action which would encourage the use of the Classification in publicly available computer-based (telematic?) and traditional information handling systems. The basic knowledge, technology and ability to carry out a suitable programme has long been available. All that is required is informed direction, capital and human resources allied with a reasonable amount of enthusiasm!

Thus one hopes that it will not be too long before the Commission does decide to encourage the utilization of the UDC both in its own information handling activities and those of other European organizations as this would be a significant step in the right direction along the road to the standardization of information handling practices.

Richard Hindson
Hindson and Partners
Chairman, BSI Technical Committee DOS/3 UDC.

REFERENCE

1 Activities of the Commission of the European Communities. Aslib Proceedings, 33 (3), March 1981, 113.

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ASLIB PROCEEDINGS

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The communications revolution

Edward W. Ploman

Executive Director, International Institute of Communications

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SINCE I FIRST heard it I have been very fond of an expression coined by a Swedish MP. She said: 'If Karl Marx were living now, he would not have written *Das Kapital*; he would have written *Die Information*'. This expression well captures the importance we suddenly attribute to issues of communications and information. It serves well to indicate how these issues have invaded the social, economic and political agenda, nationally and internationally.

It has become a truism, a cliché to speak of the communications revolution and the information explosion and the information society. But a cliché does not exclude confusion. On the contrary. In fact, we have not even been able to define what we are talking about—at least not in a manner which is generally acceptable. We have no agreed conceptual framework, no agreed terminology even. An American scholar started—some years back—to count currently used definitions of 'communications'. He wisely gave up when he had reached a figure of around one hundred. The same would undoubtedly occur in the case of 'information'—should anybody bother to count.

I will definitely not make an attempt at defining what I am going to talk about. I will not even assume that we all here are agreed on what I am supposed to talk about. What I will try, though, is to discuss—in the light of a few selected perspectives—some of the characteristics of what in the absence of a better expression we call the communications and information revolution: the processes and phenomena which we vaguely but definitely feel are changing society and our outlook on society, our relations to work and leisure, our relations to each other and perhaps to ourselves.

To start with, I hope we might agree on one basic point: that communication is a pre-condition for all social organisation—whether among animals or humans—that without communication there can be no community. In this sense, all human societies have been information societies. What we tend to forget though, is that this view of society is very new. Clearly, all through history, communications have retained the attention of rulers; all societies have regulated their flows of information. However, communications and information were largely taken for granted, seen almost as natural constants, placed in the service of other social activities which were seen as more fundamental, whether they were expressed in religious, economic or political terms. It is only in recent years that there has occurred a shift in perspective so that, for the first time, communications and information *per se* have become issues in society.

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This fundamental change in our attitude towards the entire communications/information complex is recent. We still seem very unsure about what it means and how to deal with it. Our universities and think-tanks have not been very helpful: there are as many paradigms and theories about communication as there are professors of communication. Similarly, each discipline, each profession has developed an approach of its own, as has each government department. I will do no more—perhaps no less—than offer images in a kaleidoscope.

The technological dimension

This is the first and most obvious perspective. However, I will not once again repeat the list of technical devices that are being introduced or are still in the laboratory. It is more constructive to focus on the trends of technical developments and their implications.

It seems to be an accepted fact that one of the characteristics of the new communications technology is a vast increase in the capacity to generate, store, process, transmit and receive information. There are though other trends which might be even more important:

—First, flexibility and opportunity of choice. We now have at our disposal a number of methods to provide a service where there previously was one—or none. Where earlier only heavy, expensive professional equipment was available, there are now also lightweight, simple methods which demand a minimum of expertise; we can choose our levels of technology.

—Second, the possibility of combining different, so far separate technologies, methods and systems. New forms of communication and information transfer are made possible through these combinations in patterns that were not foreseen in policy or law. This trend towards new combinations is related to a trend towards convergence, even integration of techniques and services.

—A third trend might be seen under the sign of contradictory developments, in opposite and not necessarily complementary directions. The trend towards overall integrated configurations meets another trend in the opposite direction towards decentralised, individualised concepts and patterns of use. The possible scope now ranges from world-wide networks and audiences to individual, community or underground patterns. This corresponds to the contradictory fears—or expectations as the case may be—expressed at the same time: fears of a corporate global village and Big Brother wrapped up in one and fears of the social fragmentation implied in exclusively individual or small-group or minority use of technologies and media, everyone doing their own thing.

However, we have not really looked at these trends, we have not seen the forest for all the bushes in the form of gadgets and devices. Certainly, we are all against technological determinism, but when we are offered freedom of choice we appoint another committee: on broadcasting, or on cable, or on satellites, or on data transmission, on videocassettes, or videotext or whatever else the technicians have invented between committees. And we have fallen in traps which we seem incapable of escaping.

If decisions in communications are to be made on the grounds of what is technically feasible, economically reasonable and socially desirable, it is not the technical aspect which causes problems: When it is no longer possible to hide behind technical constraints, the two other aspects take on their full importance. They demand answers to questions we rather seem to avoid, so we fall back in—or on—another trap: the constraints of having attached organisational and legal structures to a particular technology or level of technology. So, we continue to develop technologies and systems without any clear idea of either needs or implications—and then desperately search for users and markets.

The economic dimension

If we don't know how to handle technology, perhaps we can find some guidance through the second perspective I should like to mention, the *economic* dimension.

What in fact do we know about the costs of different communications systems to society and to the individual? Very little it seems to me. What we know quite well are isolated facts such as the cost of a broadcast network, of a satellite system, of a videorecorder or a film production. It is an amazing fact that despite our obsession with regulation and structure there are almost no studies on the macro-economic aspects of the mass media. I only know of a Swedish study of the total costs to society of some selected media, thus one study on one aspect. It would then seem true that 'information occupies a slum dwelling in the town of economics'.

There is one exception: the grand new mode in economic analysis which started in 1972 with the publication of Fritz Machlup's study on 'The production and distribution of knowledge in the United States'. The object of studies in this mode is no more and certainly no less than the aggregated information activities in—to use another cliché—mature industrialised societies. And the results of this approach were indeed staggering. According to one evaluation, the complex of industries that comprises telecommunications, computer and other electronic information industries has already developed to a point of being the third largest in world economy. In another study, concerned with the situation in the USA, 46 per cent of the GNP and more than 50 per cent of labour income derives from the collection of heterogenous goods and services that together form what is called the 'information activity'. Even though this concept is both wide and vague, similar analyses undertaken in other industrialised countries seem to confirm the general picture: the arrival of the information economy, the electronic, technotronic, post-industrialised or post-civilised society—according to choice.

Faced with this barrage, we would do well to recall the limitations of communication. We have barely moved beyond the reductionism of 'economic man', the famous 'homo economicus'; we should not now fall into the next trap of a new reductionism in the form of 'communication man' or 'homo informaticus'.

Also, these grand economic analyses generally suffer from a fatal flaw: in that often exclusively market-oriented approach information is treated as a commodity only, to be handled, bought and sold as any other commodity. This attitude is well captured in the expression 'the market-place of ideas' which I have always found denigrating and demeaning. Even public, social information is pressed into this market mould, not surprising when government activities are seen as no more than a burden on the private economy. Thus, education which is treated as one of the largest components of the information sector is—in one of the extreme models—'sold as a local public good by state and local governments, with the voter purchasing services as if a market were operating'.

It is in keeping with this market-oriented approach that social, political, or cultural dimensions are conspicuous by their absence. Policy, in this perspective, finally means no more than sophisticated book-keeping. The underlying assumptions implicit in this model result in a curious dichotomy: on the one hand, a sophisticated, advanced economic analysis, on the other hand an outdated and inadequate refusal to tackle social implications.

The concept of information as a commodity has, as could be expected, evolved in countries with a market economy. Even though the concept originally was not formulated in the terms we now use, it represents one of the fundaments on which the West has constructed the concept of intellectual property and the legislation on copyright. In recent times, this approach to information has spread and is applied in numerous ways. A typical example are all those new professions which function as information-brokers—consultancy firms, film sales agents, news agencies—and whose activities consist of the collection, sometimes also the production, and sale of information. Similarly, major businesses indicate information, not goods nor money as their most precious asset.

The collection and transfer of information has thus become an industry and a trade in its own right.

The implications of increasingly treating information as a commodity to be sold and bought as any other are not well understood, if at all. There are many aspects that would warrant attention. What are the consequences of valuable information not being available as a public good but only at a price which is beyond the average citizen? Another aspect of the same phenomenon concerns the availability of new advanced communication services: many of them are in fact being made available—but only to already strongly organised and economically powerful interests in society: government, industry and business, universities and research centres. The general public is left with often deteriorating public networks. Are we in fact—even without wanting to—creating a new class division in society based on the distinction between the information-rich and the information-poor?

These questions take on an even greater importance when seen in the light of another approach according to which information is seen as a resource in society, even as the key resource. This attitude is supported by the argument that information and organised knowledge have several unique properties.

The first of these unique properties is that all other resources depend on information and knowledge: it is the perception and evaluation of resources which makes their use possible. You cannot use that of which you know nothing. Thus, the availability of information determines the availability of other resources. Obviously, information seen in this perspective will have a great economic value but even more important will be its social value since all activities in society are conditioned by available information.

The second unique feature of information refers to the concept that, as a resource itself, information is not reduced or lessened by wider use and sharing. On the contrary, its value tends to gain in the process, value seen here both as economic and social value. The use of the concept 'value added' through various transactions has been applied as a crucial factor in the analysis of the 'information economy'. Less attention has been paid to the idea of added value from a social point of view, one reason being that we still do not have at our disposal the intellectual tools for the analysis of this aspect.

It has also been maintained that the use of communication and information resources, particularly of the electronic kind, would reduce or replace the consumption of other scarce resources. This aspect has not been sufficiently explored and is still controversial. However, there is already an obvious trend towards the replacement of paper by electronics in public and private administration and in such information enterprises as news agencies. In a larger and more long-term perspective, the partial replacement of physical transport by electronic communications has been discussed. The interest in such issues has originated with the recognition that electronic communications, both in manufacturing and use, are much less resource depletive than traditional industrial processes, economical in energy requirements and have a relatively low impact on the physical environment.

In comparison with the commodity concept, the resource view would lead to a different approach with regard to the production and distribution of information. The emphasis would tend to be on a wide and unhampered dissemination and flow of information which is seen as essential for the economic, social, political and cultural activities of a society.

The political dimension

The resource approach leads directly to third dimension: the *political*. One of the functions of the political system concerns the allocation of resources. And even those who favour the commodity approach do not refrain from trying to ensure political decisions concerning the organisation and control of information in their favour.

It has been part of conventional mythology in the industrialised West that communication and information are somehow neutral and therefore should be outside the political sphere. Information almost seemed as some mysterious object which existed 'out there' and which flowed in some equally mysterious manner within and between societies. If we had looked at our history, we would not have been surprised or indignant when told that information is power. That truth has been known and applied throughout history. There is the—perhaps apocryphal—story that in ancient Egypt persons other than members of the priesthood overheard reciting the sacred rituals were liable to immediate execution. An accepted example of ruthless control over information is the famous Burning of the Books in ancient China. In 213 BC, the Chief Minister Li Ssu petitioned the first Ch'in Emperor: May it please Your Majesty to determine right from wrong, to proscribe all unorthodox opinions, to destroy all historical records except those of the Ch'in ..... His Majesty must have been pleased: the books were burned and, subsequently, 460 of the greatest scholars who were suspected of knowing the books so thoroughly that they could teach from memory, were buried alive.

We might smile in our superiority. However, let us not forget that according to a French ordinance of 1566 those who printed any matter without permission were liable to be punished by hanging or strangulation. Nor, for that matter, the infamous Star Chamber Decrees in England of 1586 and 1637.

So, the combination of politics and communications has a firm tradition. It would also be difficult to maintain the myth of information as a non-political issue at a time when we see national governments fall over issues of broadcasting policy, when an international organisation like Unesco is almost torn apart over mass media issues and when data regulation engages the attention of governments and parliaments.

Seen in a larger perspective, this phenomenon forms part of a general trend towards an increasing politicization of issues. With the advances in science and technology, phenomena and processes which were earlier regarded as outside of man's power, thus as natural constants, can now be manipulated and changed by intentional—and unintentional—human intervention. We need only think about climate modification, large-scale environmental destruction, genetic experiments, outer space activities. What previously was ascribed to nature or to acts of God is now seen as the result of human decision-making, and human activities. Such issues therefore increasingly become subordinated to public, i.e. societal choice rather than being left to private, i.e. individual choice. This trend towards including an increasing number of issues and activities within the area of conscious social choice and public as opposed to private decision-making, is a marked feature of the present communications and information scene. This seems to be true of all countries, even those professing a basic adherence to a 'liberal' creed of leaving, as far as possible, the communications sector to private initiative.

There are many reasons for this trend. Among the more obvious may be mentioned the increasing linkage between national and international politics, the need to adjust competing domestic interests clustering around new communication services, and the implications of new communications technology. In terms of technology this is also expressed in the reactions against 'technological determinism'. To the consternation of engineers and technicians who bewail the intrusion of 'politics' into their pure domain, technology is no longer always taken for granted, but to some extent subject to social scrutiny and policy choice.

The politicization of issues is obvious in the case of the mass media. Rapidly, though, also other areas in communications are becoming politicized, as for example the thorny issues related to the regulation of transborder data flows. Another typical example is represented by the demands of developing countries for a 'new world information and communications order' which took the 'liberal' West by surprise.

We are not very good at analysing or coping with these problems. It might well be that some of these issues are unsolvable—particularly in a situation when governments very obviously find it increasingly difficult to govern. However, we have not even taken the first step towards an adequate management of these issues: we have not even had enough imagination to design an appropriate policy- and decision-making machinery in this field.

The role of the individual

The next dimension concerns the position, the interests and requirements of the *individual.* All too often the individual is subsumed under such expressions as the general public. or simply the mass as in mass communication. It is not much better when the individual is categorised as an abstract 'newspaper reader' or 'television viewer'.

This neglect of the individual is very obvious in the approach to communication policies which generally deal with structural arrangements, the balance between various institutions and interest groups and often do no more than pay lip service to the individual's requirements and wishes. Most of the time, the individual is no more than an object of market research, sociological investigation, or administrative rules.

There is, however, emerging—even though slowly—a new awareness of the individual's role and his participation in the communication and information processes. In one perspective, the concern is with man as a receiver-transformer-generator of information, man as an information processing organism. This approach implies a focus on the biological aspects of communication: the structure and functioning of the central nervous system and the frequency of its malfunctioning, the flow of information to the brain, and in general, on the capacity of the individual to treat information.

Preliminary research in this area has already been able to draw attention to a number of aspects that are generally not taken into account in communications policy and practice. This work in neurophysiology, applied psychology, brain and stress research is now being linked to studies of how communications system function and how people are able to use them. It has been found that all our communications systems are designed for use by individuals who, from a bio-psychological view, function at an optimum. However, it is also known that, out of a given population at a given time, some 50 per cent are not able to function at this optimum—for permanent reasons in the case of the very young, the very old, the handicapped, or for temporary reasons in the case of physical or mental illness, stress etc.

These approaches are of great relevance to the design and operation of communications systems and at a more general level, to the general policies with regard to the introduction of new technologies and services. The highly differentiated and individualized services offered by new technology will affect people differently. In particular, it has been stated that they will favour those already well educated: they are better equipped to make deliberate choices among media and information flows than the poorly educated or otherwise disfavoured groups who are ill-protected against an unselective flow as well as against biased and misleading information.

This again points to a real risk in current developments, that of creating two classes in society: the information-rich, those who for physical, educational, social and economic reasons have access to new information services and are able to deal with both them and the information; and the rest of the population, including the really information-poor who, even if they had access to new services would not know how to deal with them.

It has proved extremely difficult to provide reliable information on the individual's use of different media and services over a larger time frame. Pronouncements on future patterns of use have often proven ridiculously wrong. One of the possible reasons for this difficulty in evaluating and forecasting individual communication and information use, could be an inadequate and faulty approach to the problem. It seems necessary to change the perspective from looking at each medium or service in isolation and start from the concept of all the information flows between the individual and his total environment, physical as well as social. The concept of the individual's total information environment seems useful: whether this environment is rich or poor, adequate or mediocre, the individual will not use any one medium in isolation but within the context of all available means of communication.

This is exemplified by the observation that, for a student in an industrialised society, the existing, informal 'university' includes the evening news on television, cheap paperback books, underground press, pop music, student exchange programmes, demonstrations, teach-ins and sit-ins, cinema and video. He will use all information media and communications channels available to him. 'At the same time, it seems to be uncomfortably clear that such acknowledgement of these new modes of expression as has occurred has been both casual and quixotic. The rigorous preparation assumed as a prerequisite of the conventional literacy of reading and writing has not yet been widely applied to or accepted for the use of film, television, radio, holography, the underground, or any other of the many evolving means of human expression. As a result, we have suffered in employing these means from the misuse and under-use characteristic of illiteracy.' (Donald R. Gordon)

The cultural context

All these aspects of the communications revolution converge on what will be my final dimension, the overall *cultural* context.

It is always difficult, if not impossible, to identify the most important features of one's own period—as proven by the many images and labels that have been used to describe our time, our society and ourselves. We have been told that we are living in an age of space and atoms, of discontinuity, in an accidental century; in a society that is stagnant, imperfect and unprepared, or technological, post-industrial, technotronic, computerised or slightly more up-beat: a learning society; we ourselves are inner- or outer-directed, we are one-dimensional, post-historical naked apes.

However, a strong case has been made for the view that we are living in an era which may become known in history more for the enormous expansion of communication channels and information flows than for any other development. Some observers see the advent and expansion of electronic communications as a fourth communications revolution, alongside and of similar importance as the three earlier ones: the invention of speech, the invention of writing and the invention of print. In another perspective, the movement towards the all-pervasive use of sophisticated communication devices is compared to the transition man has made from hunting to agriculture, or more recently from agriculture to industry.

This is a new way of looking at society and history, a new interpretation of culture. Concepts from communications and information are spreading into other areas and there is a whole new language which reveals these modes of perception and analysis. We now talk about genetic codes and the language of the genes; about the grammar of rationality and the political economy of signs and symbols. We describe and map information spaces of the most varied kind and analyse the semiotic space in which politics move. A French economist is working on a new economic theory in which capital and labour will be replaced by energy and information.

In overall cultural terms, we are dealing with the emergence of a new communications and information environment. We introduce new time-scales of slow-motion and ultra-rapid, we change the spatial scale by picturing the infinitely small and the outer reaches of cosmic space. We are beginning to perceive that changes in the modalities of communication are crucial in their impact on cultural forms and identities. New technologies reshape the information content of societies. Their larger impact is on the symbol systems which sustain all cultures and our images of the world. Through the new communication systems we are dealing with the signals and messages which change us as well as with those through which we act upon our environment.

But—the recognition of this new approach to ourselves and to our cultures does not seem to help us very much in going beyond our present confusion and muddle. We desperately need more clarity in our attempts to cope with the series of unprecedented problems that face us: for the first time in history one species has become totally dominant and overrun the globe, and for the first time we have the power to destroy the only home we have, whether by a big bang or a slower erosion of the environment.

Together, all these points bring me to my last point: I believe that the basic issue we face concerns the creativity of societies, the creative capacity of a nation. We are faced with a number of unprecedented challenges and problems, some of which will demand the enormous task of social transformation for their answer. One of the few thinkers of today, the Indonesian planning expert Soedjatmoko, now Rector of the UN University, has expressed it much better than I could ever do:

> 'The capacity of a nation—not just of its government, but of society as a whole—to adjust to rapidly changing techno-economic, socio-cultural and political changes, on a scale which makes it possible to speak of social transformation, very much depends on its collective capacity to generate, to ingest, to reach out for, and to utilise a vast amount of new and relevant information. This capacity for creative and innovative response to changing conditions and new challenges I would like to call the learning capacity of a nation. . . . . . What will have to be enhanced in a short period of time, in both industrial and developing nations, is the capacity for critical judgement. Critical judgement lies at the heart of a nation's capacity for discovery, creativity and innovation. . . . . . We will have to learn to develop new ways and instrumentalities for these purposes in order to bring about the attitudinal changes which are needed to deal with the vast transformations the future will bring. We will all have to learn how to live with the uncertainties of change, with rapid change as a permanent condition of modern life, in ways which do not lead us, in fear and self-protection, constantly to fall back on the primordial security and loyalty of one's own primary group, in hostility with all the rest. We will have to learn to live with the increasing vulnerabilities of extremely complex modern societies and an extremely fragile and complex world. One question then which we have to face is, can modern communications be used—and, if so, how—almost against its inherent social characteristics, in ways that will maintain and strengthen the essential pluralism of our societies, in ways which will ensure greater capacity and opportunity for the weak, the poor and the uninformed to participate effectively in decisions affecting their lives and those of their family?'

In reacting to these new challenges, in building and using our new communications capabilities, would we not have to base ourselves on the central theme of Barbara Ward's thinking: the need to be loyal to all mankind. And what better way to finish

From paradigm to practice: the logic of promotion

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AS YOU MAY well have guessed from the title of this paper I intend to concentrate today on the thinking or rationale behind library promotion. I make no apologies for the fact that my approach will be in the main theoretical because it seems to me that there is little point in discussing the mechanics of library promotion unless we first have a clear idea of why libraries should be concerned with developing what Ralph Gee referred to as a 'promotional creed'.[1] Despite a healthy and growing awareness of the need to, for want of a better word, *sell* the library and its services more effectively, there are, still, pockets of scepticism, resistance and suspicion within the profession; for some of our colleagues the principles and practice of marketing have no place in the canon of librarianship, and it's for this reason that I feel a good spring-cleaning of our ideas and assumptions about library promotion in general will not go amiss. For that reason I'm deliberately going to sidestep the question 'What does library promotion involve?' and concentrate instead on the logically antecedent question 'Why *should* libraries be concerned with promotion?'; that is to say, I'm going to focus on the function rather than the tools of promotion. As Patricia Berger put it recently, 'the financial stability of public libraries depends on a continuous and total public relations program rather than isolated incidents; long range preventive methods rather than a remedial or crisis orientated approach will help public libraries persuade communities of their indispensability'.[2]

Judging by the number of times I'm asked, 'Well, what good does all this talk about marketing and promotion do?' it would appear that the logic of promotion is not universally appreciated. Even among the converted there is, to put it bluntly, a tendency to confuse function with purpose when talking about promotion. Let me explain what I mean by that. Promotion at the practical level can draw upon an infinite variety of techniques, tactics, materials and media, which can in turn be scaled to whatever level of sophistication is desired, or can be afforded, but promotion, the essence of promotion if you like, is something more than the sum of these means and methods. Promotion is not just another library activity, discrete and intermittent, like, say, cataloguing or classification; ideally it is a reflection of a particular management style, or philosophy of presentation, which can, and indeed should, permeate the library service and all it does. In fact I would go a little further and argue that promotion, in the broadest and most generous sense of the term, includes the ability to anticipate social or organizational change, to interpret the implications of such change, and to convert this awareness to one's own advantage.

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In the last five to ten years much has been written, and, I suspect, considerably more spoken, about the application of marketing principles to the management of library and information services generally. In this country we owe a considerable debt to people like David Yorke[3] who have gradually introduced us to the 'mysteries' of marketing and showed us just why marketing is important to the successful operation of library and information services. But we are also indebted to the American writer Philip Kotler, whose classic book 'Marketing for non-profit organizations'[4] finally buried the notion that service, charitable and other non-profit concerns could not apply the marketing concept to their activities.

In management parlance the term 'marketing mix' refers to the various techniques which an organization selects as being most appropriate to enable it to achieve the desired client or market response. The key elements in the marketing mix are sometimes referred to in abbreviated form as the '4 P's' (product, pricing, place and promotion). Successful marketing depends on achieving the optimal balance between these four elements. Naturally enough, the juggling of emphasis, the selection of priorities, varies from organization to organization, from context to context and from one time to another. It's fair to say, however, that libraries have a tradition (an unimaginative tradition) of relying almost exclusively on what might be described as product-centred or minimal marketing; in other words we tend to feel that all we have to do is sit back and wait and people will come to our doors (a) because they always have done, or, (b) because the service we have to offer is of such self-evident high quality. This is what I like to refer to as the fallacy of the service that speaks for itself. I'm certainly not trying to deprecate libraries or librarians, but self-effacement and self-congratulation are not the best ways to guarantee longevity.

Promotion has to do with cultivating and maintaining visibility, and is the final component in the marketing cycle, a cycle, I might add, which includes, but does not, as so many librarians seem to feel, end with the increasingly popular user study or community profiling exercise. Market research, which for the library profession is what user studies and community profiling exercises amount to, involves the mapping of the organization's customer universe. Obviously it makes sense to define and segment the population you are serving before you begin to develop or publicize the services and facilities you can offer. However, there is limited practical value in characterizing the library's public, or publics, I should perhaps say, in terms of structural, demographic or attitudinal variables if we don't then capitalize on this information to promote the service more effectively. The well-known, and oft quoted, public library surveys of Luckham[5] and Groombridge,[6] along with the more recent Hillingdon study,[7] are notable attempts at library market research; but why have there been no surveys of comparable ambition and sophistication which have attempted to explore the effectiveness of systematic library promotion? Apart from a few small-scale studies, most of which seem to have concentrated on the potential of direct mail advertising, there has been little of note[8, 9] I think it says something about the state-of-the-art in this area that, apart from one American PhD thesis which investigated the impact on library circulation figures of advertising via cable TV,[10] just about the most interesting piece of work, certainly the only properly longitudinal piece that I can think of, is a study which is underway in the tiny Canadian community of Shellbrook.[11] Here, and I confess my information is largely second-hand, the intention has been to develop and evaluate a three-year community awareness project, the aims of which are as follows:

(1) to plan, implement and evaluate a full-scale public relations programme for Shellbrook library
(2) to obtain maximum support for the library as a community institution and for its current and proposed services and
(3) to document each step of the project, compile and publish the results

What is noteworthy about the Shellbrook project is the fact that for once the stages and procedures have been systematically planned and scheduled, so that the effects and effectiveness of the various elements of the programme can be properly evaluated. I personally look forward to the results of this experiment, its smallness of scale notwithstanding, and only hope that it acts as a catalyst for further, more ambitious exploration of this kind.

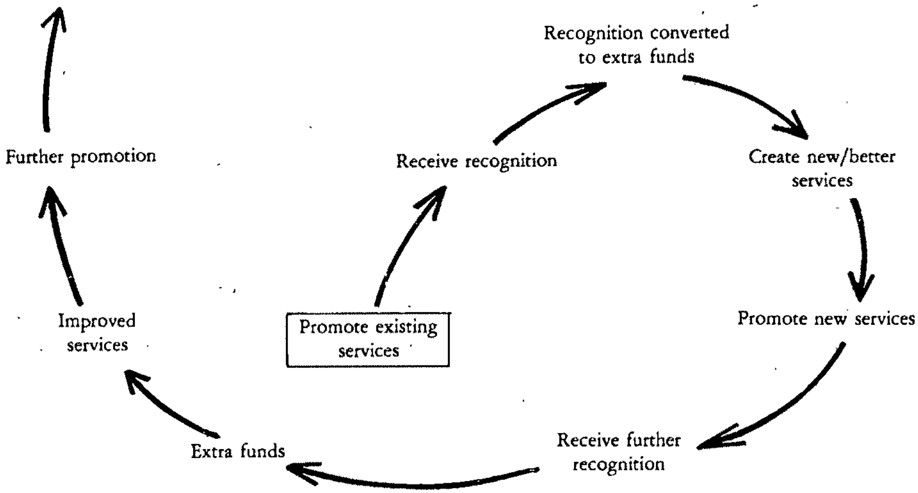
I've said on another occasion that I think user studies are on the whole a good thing, but while user studies tell us more about our publics they don't actually tell our publics anything about us. It's all very well remodelling and redesigning our services in the light of what user studies tell us, but it's important to remember that the changes we may propose or invoke have to be announced to those whom they are supposed to benefit. Successful promotion should, by definition, result in increased visibility for the library (and, thereby, greater use and appreciation of the services available), but promotion can also play an important part in consolidating the library or information service's case for continued funding. When, as at present, accountability is the order of the day, be it to a local authority committee, an academic council, or a hardened corporate finance director, self-effacement is an inappropriate posture. Granted visibility may not always correlate with productivity, as gauged via traditional output measures (e.g. the number of issues, registration levels or the number of enquiries logged), but achievement without visibility constitutes a weaker bargaining base than achievement with visibility. Margreet Wijnstroom, Secretary General of I.F.L.A., expressed the ideal rather well when she said:

> 'If we feel that our library is run on insufficient resources, we must not indulge in blubbering complaints, which are sure to irritate our users. A businesslike, positive and imaginative approach will be far more convincing when stating the case that libraries are not really some kind of optional extra, but that their use and value is immensely out of proportion to any funds that are spent on it or by it.'[12]

The point I'm trying to make is that promotion is a lot more than distributing leaflets, sticking up posters or grabbing a few minutes airtime on local radio (though, of course, it includes all of these and much more besides); effective promotion has a snowballing effect and, in a sense, feeds off its own achievements. Patricia Berger's recent research tended to confirm this notion; she found that there was a positive correlation between the level and sophistication of public relations activities and library budget allocations.[13] I call this the 'cumulative advantage theory of promotion', which, in diagrammatic terms, produces a development spiral of the kind shown in Fig. 1, albeit in idealized and exaggerated form. The four elements in this cycle are promotion, recognition, reward and development. Allan Whatley, writing some time ago in the *Library Association Record*, expressed it slightly differently, and possibly more persuasively. He said:

> 'If one accepts the theory that nothing succeeds like success then the more business a library can attract the more likely it is to win the attention of the public and more support from the local council: the more issues, the more inquiries, the more public demand and thereby irrefutable evidence that the service justifies greater resources.'[14]

Perhaps in reality things are not always quite so smooth and ordered, effect flowing neatly in the wake of cause, but I know for a fact that Horst Ernestus' experiences in Wuppertal amply confirm the success breeds success theory. And, if we had time I could cite, as I'm sure many of you here today could, other cases, from a variety of settings, which testify to the real as opposed to imagined benefits of thoughtful and coordinated library promotion.


Recognition converted to extra funds
Further promotion
Receive recognition
Create new/better services
Improved services
Promote existing services
Promote new services
Extra funds
Receive further recognition

PROMOTION → RECOGNITION → REWARD → DEVELOPMENT → PROMOTION →

FIG. 1 *Cumulative advantage model of promotion*

I'd like now to return to something I touched on earlier, namely, the idea of promotion as intelligent anticipation, and in so doing I propose to digress slightly in order to launch an attack on professional complacency and short-sightedness, simply because I think this may be the only way to dispel the conviction that promotion is a fringe activity, which may, on occasion, produce small-scale, short-term benefits, but little of enduring worth. And, by implication, I hope to make clear the distinction between selling and marketing. Selling is an attitude which focusses on the needs of the seller/supplier rather than the needs of the buyer/receiver. Marketing, on the other hand, is concerned with improving customer, buyer or patron satisfaction.

In life, products, services and ideologies, no less than humans, display a remarkably conformist pattern of growth, maturity and decline. This pattern of development and dissipation is conveniently described by what is known as the life-cycle curve, which, though most frequently used to chart the life of a product, can be applied with equal validity to services. The curve in Fig. 2 describes in general terms the rise and fall, if you like, of such 'institutions' as the transatlantic liner, the magazine 'Picture Post', or the mini-skirt. Taking an illustration closer to home, as it were, we might like to think of the fate of the manuscript up to, or just immediately after, the time of Gutenberg's discovery of moveable type as being described by the various segments of our notional curve (introduction, growth maturity, decline). Now, I know it's fashionable to think in terms of multiple life cycles, but if you will grant me a degree of licence I should like to imagine the history of the public library service in the United Kingdom fitted onto our single curve (see Fig. 3). In this instance we would take as the rough starting date the year 1850, and, arguably, the expansionist period of the 1960's could be considered the period of maturity, and extending this licence we might begin to think of the close of the twentieth century as corresponding to the point where maturity fades into decline. Just as the advent of the printing press irrevocably altered the way in which information could be disseminated and controlled, so will the proliferating micro-electronic storage and retrieval media bring about technological and social change orders of magnitude greater still. The implications for libraries of all kinds are profound and the difficulty facing libraries lies in trying to decide on the most appropriate adaptive strategies.

Before I go any further let me just say that I am not merely trying to appear fashionable by espousing this particular form of professional pessimism, and nor am I alone in my questioning of the continued relevance of the traditional concept of the library service. Dennis Lewis has argued that by the year 2000 the information officer and the librarian will, and I quote, 'have gone the way of the brontosaurus',[15] and his argument, let me warn you, is based, not on rhetoric but reason. For those of you who feel that all this is nothing more than scaremongering I suggest you take a look at the set of risk statements he presents for the different sectors of the profession. Tony Wight in a thought-provoking report on the impact of the new technology argues that, and again I quote, 'the objectives of the public library services require a fresh reappraisal and some explicit agreed redefinition if they are not to become increasingly inappropriate to changed circumstances, and then suffer progressive decline leading to collapse or a withering away'.[16] You see, as far as information transfer is concerned it doesn't take a great deal of insight to realize that libraries are little more than 'delay lines'[17] in the transmission process, and that in an era of rapid technological advance the library, as presently constituted, can very easily appear anachronistic.

I have intentionally painted a picture of gloom so that I can throw into relief the importance of timely and resourceful promotion for libraries and information services. As we enter what futurologists like to refer to as a 'zone of discontinuity' (where developments and outcomes are unknown quantities) we cannot really afford to trade

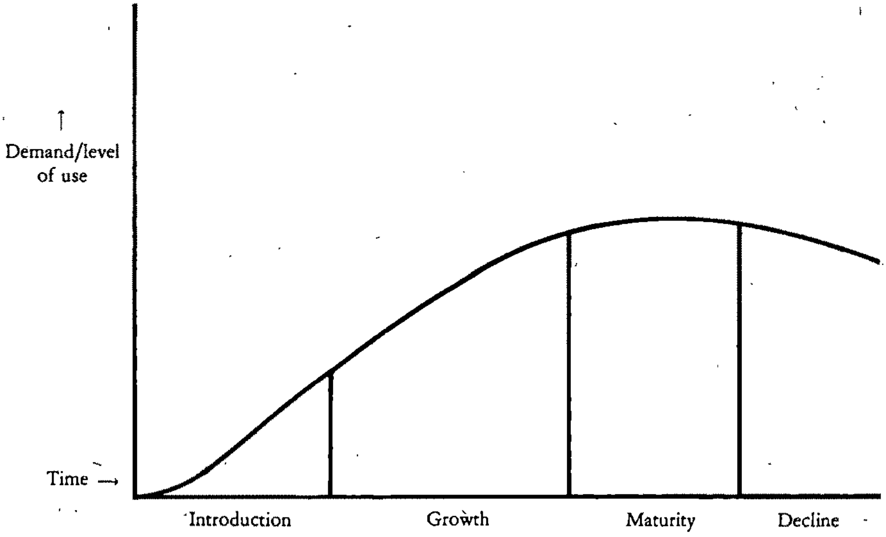


FIG. 2 *Life cycle curve*

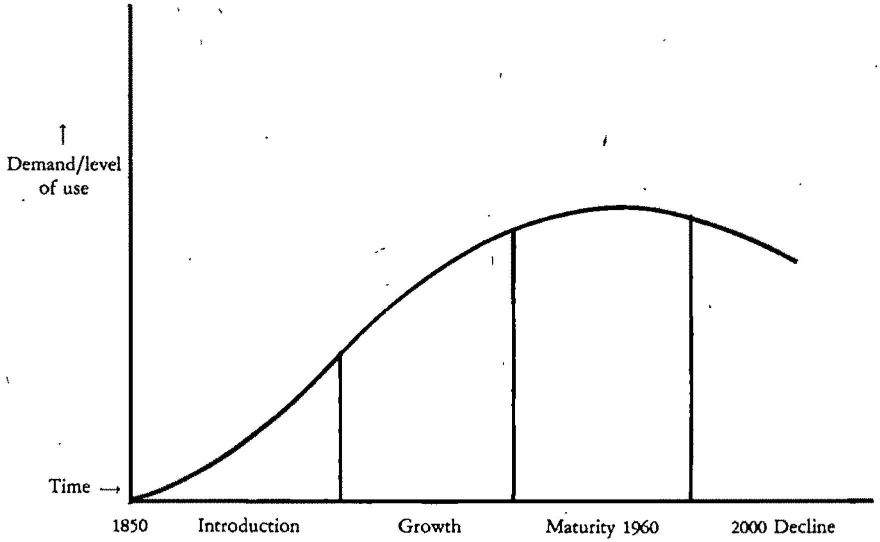


FIG. 3 *Life cycle curve: the public library in the U.K. 1850–2000*

on tradition and stand idly by on the sidelines. We need instead to keep one step ahead of social trends and expectations so that we can devise appropriate service responses, and create societal or organizational dependence on the library. It has been suggested that we are now firmly in the age of problem-based or social value-orientated information, as opposed to subject or mission related information[18] (witness, for example, the interest in community information provision, or the importance attached to library services for the disadvantaged) and it is possible that by reacting creatively and innovatively to shifts in social and organizational attitudes the library *can* establish itself as an institution of contemporary relevance. The profession will have to continue, maybe even speed up, the process of shedding restrictive practices, examples of which were, or are, chained books, closed access, borrowing limitations, user-unfriendly staff, barriers to membership, punitive fines, and continue to develop the image of a relevant and caring institution as instanced by the attention currently given to, for example, outreach, user-education, atmospherics, the formation of special undergraduate, mixed-media and short-loan collections, the provision of S.D.I. services and the design of efficient back-up document delivery systems. By anticipating social and organizational needs the library can work itself into a position where it is seen as the natural, if not perhaps traditional, support service for a variety of human needs and functions. Think for a moment of the recent co-operative venture involving Gateshead library service and the Tesco supermarket chain whereby old age pensioners can tele-order their groceries direct from the warehouse by using a terminal in the local library.[19] Libraries have already begun to move beyond the constraining association with books and reading by offering online and videotex facilities to their patrons. In the United States a number of libraries are experimenting with community video programmes; some of you may have read about the pioneering work of Edward de Scoria at Port Washington Public Library.[20] In this country I see the possible development of open system learning schemes as providing the library service with a golden opportunity to establish itself as an ally in this educational innovation, not just by being a storehouse of books and other printed resources, but as a local communications centre where students can dial up course units at will without any of the fixed-time, fixed-frequency restrictions currently experienced by Open University students who are dependent on TV broadcasts. It's not surprising is it that the Council for Educational Technology sees Prestel's future as a transmitter of telesoftware for computer assisted learning?[21] In urging information officers to acquaint themselves with the operation and potentialities of non-bibliographic databases (or databanks as they are commonly called), Houghton and Wisdom are echoing the sentiments of many other observers of the information industry who feel that the profession has been slow to appreciate the implications of online access to and manipulation of numeric or factual data. They argue that the 'age of the dinosaur library, strangled by the internal complications of its hardcopy files and its manual records is over',[22] and that the traditional reference function may be taken over by service suppliers and information brokers. First the brontosaurus, now the dinosaur; these comparisons are revealing, are they not? By taking the initiative, by displaying adaptability the library will improve its public image and in the process kill off some of the unhelpful misconceptions which prevail. In some areas the library's functions will undoubtedly be attenuated, if not superseded; in others expanded, but it is up to the profession to win for itself confidence and respect through vigorous self-promotion and initiative taking. The library, be it public, special or academic, can no longer afford to ignore what O. B. Hardison, in discussing the future of the large research library in the United States, referred to as the 'imperative of responsiveness';[23] the library which does not speak until spoken to is destined to slip into obscurity.

So far I have relied on fine sounding phrases and arguments based on theoretical premises, but rest assured I could equally well have plumped for the case study approach and presented you with experientially-derived evidence of just how effective co-ordinated promotional campaigns can be in terms of strengthening the library's public or corporate image. Some months ago I completed a report entitled 'A National Graphics Resource Centre for Libraries in the United Kingdom',[24] in which I argued the case for nationally orchestrated library promotion in this country, and though I don't want to go over the arguments or proposals again here, there is one point which I would like to deal with because it crops up whenever discussion comes round to the question of finance. There is a school of thought which reasons that expenditure on promotion and advertising is, if not impossible, at least inappropriate during a recessionary period. The negativism of this view, let it be said, is not peculiar to librarians, since in almost every economic downturn in the U.K., from 1960 onwards, advertising expenditure has fallen predictably and dramatically.[25] However, there are now signs that major advertisers have come to accept that slashing the advertising budget is neither the most far-sighted nor most efficacious solution when faced with a trading slump. For as long as I can remember, librarians in the U.K. have been saying that the time is not right, right for promotion, but if we accept in principle the forecasters' predictions of the library's medium-term future, then the time most certainly is right, and, what is more, would appear to have been right for several years.

Maybe you are inclined to disagree with much of what I have had to say, but is there not at least a case, as much on the basis of experience in industry and commerce generally, as on the basis of the comparative evidence available in the field of librarianship itself, for abandoning our outmoded attachment to the precepts of minimal marketing and experimenting with more progressive and enlightened techniques? Don't misunderstand me, I'm not advocating what our American colleagues dismissively refer to as 'hucksterism', the sort of approach which prompted Steve Sherman to write:

> 'Public relations for libraries need not be a means of turning a library into a circus with bookshelves. Librarians don't need to hawk their wares like sideshow barkers or wear purple striped shirts and dresses under chartreuse beanie caps with plastic propellers to make their point. Thie may be P.R. for used car dealers and county-fair callers. It isn't and shouldn't be public relations for librarians.'[26]

Judging by the most recently published estimates of public library expenditure on promotion and publicity, produced by the Centre for Interfirm Comparison in the U.K., there is much scope for improvement. I wonder how many of you knew, or would have guessed, that expenditure on promotion, and publicity expressed as a percentage of total library system costs, ranged from an embarrassingly paltry 0.001% to a maximum of 0.23%. Contrast this with the recommendation in a report published a couple of years ago in West Germany, which proposed that libraries should allocate

5% of their operating budgets to publicity and promotion.[28] I'm not foolish enough to suggest that a few thousand pounds here and there will in any meaningful sense transform the library's public face overnight. At a time of retrenchment it is unlikely that promotion in the public sector will activate a development spiral of the kind I described earlier (see Fig. 1), but I would contend that promotion might be one means of fighting to maintain existing levels of funding, in the sense that successful promotion will draw favourable attention to the library or information service and in so doing provide those who control the purse strings with confirmation of monies wisely spent. In a period of recession it may well be that effective promotion is the difference between steady-state and contraction, and that, I'm sure you will agree, is not a trivial distinction. In concluding I would like to echo the sentiments of Paul Wasserman when he said that we are 'some distance from universal acceptance of the view of information as a competitive product, one which requires the same meticulous attention to market strategy and sensitivity so long characteristic of other forms of commodity distribution and service provision in our cultures'.[29] Finally, let me leave you with a quotation from Paul Sykes' lively book 'The public library in perspective', which, though dealing specifically with the public library movement in the United Kingdom, contains a message for all those working in the information world. He says:

> 'At no time has the importance of intelligent promotion of public libraries been greater than at present, partly as a result of the need to convince national and local government of the library's potential as the power base for community affairs, and also to promote its community informational and educational roles. In the field of information assembly, collation and dissemination, the existing capacity of the public library, let alone its potential as an economic asset, is frequently overlooked by government and industry.'[30]

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Do you relate? Practical public relations

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An illustrated paper presented at the Aslib conference 'Promoting and publicising library and information services', London, Aslib, 16 March 1981

LET ME START with a song:

> 'Oh the place for you
> And the place for me
> Is the local public library
> They have books and things
> That they lend for free
> It's the latest
> It's the greatest
> It's the library'

(The Library song, folk version — Libraries in New York State)

Some of you may recall the folk music festivals of the late sixties and early seventies. At one of these the pleasant and gentle proceedings were interrupted by the sound of a low flying aircraft. Streaming from its tail was a banner carrying the single question: Do you relate?

Today is not the time to examine the significance of that theme to the psychedelic world of the sixties, but at the risk of sounding like a trendy cleric, I should like to take it as my text for this paper and ask, how can we make our promotional activities relate to the variety of publics that library and information organisations serve? Such organisations need to relate to a wide range of groups and individuals. Public libraries by definition have a diverse clientele. Academic libraries, be they in Universities or Polytechnics, serve students, teaching staff, administrators, researchers and other groups. Special libraries perhaps have more identifiable publics but not all of their members will always be fully aware of the range and value of the services provided.

Promotional activities should also of course be aimed at a wider audience than those immediately served by the library organisation. The potential user, national and local legislators, suppliers and library staff should all be on the receiving end of library public relations. Each of these groups can be further divided in terms of special interests, race, sex, class, religion, age, geography, education and a wide range of other variables. In seeking to open channels of communication between our library organisations and these groups and individuals we must be aware of, and take account of, such differences. Differences that can both hinder and help the flow of information

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and ideas. These differences are important not just in terms of the services the client requests but also when considering his or her motivation for using the service in the first place.

In this presentation I shall attempt to itemize ways in which a persuasive communication can be made relevant to a library's community and/or to identifiable groups within that community. In so doing I will of course discuss various forms of promotional communication, but rather than considering each type of communication in turn, I intend to concentrate on a number of audience factors. These are:

(1) Audience motivation—i.e. what does the audience seek from its relationship with a library.
(2) Audience interests.
(3) The socio-economic and educational background of the audience.
(4) Audience prejudices and perceptions.
(5) Audience relationships with a particular communication medium.

There will obviously be a degree of overlap between these areas.

The first task of a promotional communication is to attract the audience's attention. One only has to consider advertisements to see how this is sometimes achieved by introducing a stimulus which has little or nothing to do with the actual product. The nude on the car bonnet, the handsome creature that appears after a Badedas bath are not only attention grabbing but also carry other implications. Thus the motor car or bath oil are given an additional appeal to that of transportation or cleanliness.

McGarry and Burrell[1] have identified six appeals that can be used by library organisations:

1. *Social* appeal: *Everybody* uses the library!
2. *Prestige* appeal: *All the best people* use the library!
3. *Survival* appeal: *No one can compete* in modern life without help from the library.
4. *Fun* appeal: Use the library for *fun and leisure*!
5. *Egomaniac* appeal: Knowledge is *power*!
6. *Fear* appeal: if you don't use the library your friends will *ostracize* you!

There are other persuasive messages that could be used, for example one could link library use with self-improvement, financial advantage, or success. The most recent campaign from the American Library Association uses the 'success' appeal. Adopting the slogan 'The library is full of success stories' the campaign involves posters portraying child look-alikes of the famous standing in front of libraries clutching books related to their success in later life. In one, Billie Jean King, is shown holding a beginners guide to tennis and in another, Arthur Fiedler, a similar text for musicians.

In the same way that users or potential users are seeking a reward from their relationship with the library, so too are the staff. Maslow,[2] Herzberg[3] and the rest have told us enough about motivation for us to be aware that people do not work for money alone. They seek a number of other rewards. The need to belong, a recognition of status, achievement and so on. The effective library manager ensures that each member of staff feels that he or she is making a contribution to the library organization. Each assistant, each porter as well as each professional worker should be made to feel that he or she matters. As part of our internal public relations activities we should, as managers, demonstrate that we recognise the individual worth of each member of staff. This will help staff morale and aid performance. It is staff performance above all that affects the public's perception of the library and the service it offers. Successful external relationships with the people who use, or could use, libraries depend on there being successful internal relationships between the people who work in them. As one American writer says 'without that internal "tick" generated by open communications and understanding within the library itself. . there can be no external "click" out there in the community.'[4]

Out there in the community there are groups and individuals with a wide range of interests. Whatever the form of your promotional communication, it should be tailored to these interests. For example, if you are called upon to talk to an organization or society a little preparatory work before the event can help you identify your audience and indeed identify with it. As part of such preparation ask the organizers to send you a copy of their annual report and/or calendar of events. A reference in your talk to an earlier happening or to one of their personalities or issues indicates to an audience that you are interested in their activities. This will help increase their interest in you and your organization. Politicians are very adept at this technique. I recall President Carter winning over an audience in the North East of England by using the phrase 'hawa the lads'—the rallying cry for the local football team.

The same talk presented in the same way to different groups just will not do. Even if you are giving a general talk about your library and your services, you must make sure that it relates to the interests of the people in front of you. With an audience from the local Chamber of Trade, a public librarian could usefully emphasize services to industry and commerce, the same librarian talking to, say, an old folks luncheon club might include a reference to pre-retirement literature or local studies material. Each of you could prepare similar examples based on the knowledge of your service and your library community.

Specialist interests can of course be reached in other ways. Britain probably has more newspapers per head of population than almost any other country in the world. The national dailies and the weeklies all have their specialist sections. When your library prepares a booklist or mounts an event relevant to such interests, let the press know by the means of a properly constructed news release addressed, if possible, to a named journalist. In addition to the national press there is also a vast range of papers aimed at specialist interests. This country has magazines covering every conceivable interest and specialisation. A review of the literature of specialist topics may well be of interest to the reader and thus editors of such papers. The publication of such a review identifying a library or librarians will increase the visibility of the service. Similarly the library of a firm or other organization can increase its visibility by means of a feature or better still a regular column in the parent organization's house journal. As a member of the British Institute of Management, I know more about that organization's library because it is regularly featured in *Management Review and Digest*. In the same way the Co-op library and information unit promotes itself via *Contact* a C.W.S. employees' publication.

It is perhaps too obvious to say that any specialist service should be promoted to the appropriate specialist audience but one should also consider the specialist potential of other areas of a library's work. The New York Public Library has, with the objective of fund raising, produced a film aimed at the city's commercial community. This shows the departments and services of N.Y.P.L. emphasizing their particular relevance to the business world. The film not only looks at the obvious 'commercial' departments, but also at others whose relevance is not so immediately apparent. It considers, for instance, the Oriental Collection and shows the businessman how it can help with all kinds of useful information ranging from general facts about the economy of the Orient to a telephone number found through the Tokyo telephone directory. This film is also a fine example of how public relations (PR) communications can be usefully directed towards small but influential audiences.

Audiences will of course have different socio-economic, cultural and educational backgrounds. This can affect their reception of, and reaction to, your message. In the time available to me I can only give a few examples. To start with the obvious, let us look at language. I would hope that it no longer needs saying that where a significant section of the library's community first language is other than English, then guides, booklists, signs and so forth should be produced in the appropriate language. We must consider also the level and complexity of the language we use in library publications. Indeed in some instances a comic strip or highly illustrated form might be the most effective. Of course when communicating with a lay audience one should avoid the use of library jargon. Jargon can sometimes aid communication between professionals but it mostly confuses the public. For instance the letters B.L. for British Library may well mean something quite different to members of the public used to reading about the trials and tribulations of the British motor industry.

Language can also mean different things as a result of racial and class differences. As Bernstein[5] has demonstrated this can have serious educational implications. In the library too it can lead to misunderstanding. Staff can be one of our most important PR assets or liabilities and they need to be aware of some of the pitfalls of staff client interactions. Some of you may have seen the BBC-TV 'Horizon' programme showing an ill-tempered encounter between a bank clerk and an Asian customer. The problem was caused by the misreading of non verbal signals—in this instance the tone of voice. To the clerk the Asian sounded rude but this, as the programme showed, was not the case. The clerk had misinterpreted the intention of the client's intonation. I have observed the same kind of problem in university and polytechnic libraries.

The question of class can also affect a staff–client encounter. In an interesting experiment carried out for the Open University[6] an actor drew different responses to his request for information depending on his apparent social class as indicated by different styles of dress. This particular experiment did not involve librarians but its results are, I think, significant for them.

It is our job as library managers to make sure that the staff themselves are aware of such problems. Through training and by example we must make sure that assistance to users is given top priority. Staff must never appear condescending when faced with 'trivial' requests. It may seem unimportant to the assistant but it is likely to be important to the client. If people who make a considerable psychological investment in asking a question are made to feel that their requests are a waste of time, they may not ask for help again. If they are unable to find their way round the library, they may simply leave, never to return. A library is a familiar place for a librarian, but for many people it can be more than a little frightening. Staff should, therefore, 'study' their clients so as to be able to appreciate their problems. Knowing the clients in order to satisfy their needs should be the aim of the staff of any service institution. In terms of public relations there is no better publicity than the recommendation of a satisfied client.

There are some libraries who 'tailor' their staff to the needs and/or background of the client group to be served. In a sense subject specialists are an example of this, but the appointment in public libraries of black or brown librarians as immigrant liaison officers or ethnic minority librarians is a new variation on the theme. It should perhaps be said that the benefits of such appointments are not universally accepted within the public library profession. However, special efforts should be made to reach the ethnic minorities present within many public library communities. The need for publicity in appropriate languages has already been stressed elsewhere, but ethnic groups should also be approached through their own community associations and organizations. Public libraries should also promote events of special relevance to members of ethnic communities. Such activities might include black writers' exhibitions, musical evenings, or film shows. It is important that such functions are not perceived as being imposed on a community and the librarian should consult and cooperate with representatives of the groups concerned.

In planning any promotional activity, we need to be aware of peoples' prejudices about, and perceptions of, our library service. In designing a message for them, we should build on their good impressions and attempt to correct the bad. Let it be said that where a bad impression is the result of a poor standard of service that the fault must be corrected. Public relations is about the reality as well as the reflection of a library service.

It is necessary to look at our services through the eyes of our various publics. They will all have different perceptions of the organization. For each of them the library will, in balance sheet terms, have PR assets and PR liabilities. The identification of these is an integral part of PR planning. In a typical library, assets could include helpful staff, an accessible location, good signage and so on. Liabilities could include belligerent staff, reminding us of Raymond Chandler's phrase about the 'acid-faced virgins that sit behind little desks in public libraries and stamp dates in books', erratic overdue procedures, or a poor building. By paying close attention to all aspects of the service, it is possible to draw up a PR balance sheet listing those things which help and those which may hinder the library's image.

On the basis of such preparation, one can begin to produce a practical programme of activities tailored to the library's needs and resources.

That programme could include the use of:

(1) Paper and print—from glossy annual reports to single sheet bulletins.
(2) Audio visual methods such as tape-slides, films or flexidiscs.
(3) Design and display.
(4) Press relations.
(5) Radio and television.
(6) Public speaking: to an audience of hundreds in a conference centre or a few gathered together in a draughty church hall.
(7) Staff training in interpersonal skills

and a variety of miscellaneous methods ranging from promotional buttons and balloons, competitions and free samples to tours and the library's livery.

I have dealt with these in detail elsewhere[7] but for the purposes of this presentation should like to concentrate on the relationship between the audience and its use of a particular communications medium. For example, library publications have been called 'the sales literature of the library' but it is quite wrong to assume that the same piece of material will be equally effective with all sections of the library's public. Non users and users respond to different stimuli; staff and committee members, each require a different approach, professionals and lay public a different emphasis, and so on. Consider also if the publication is one to be kept, a guide or directory for example—or one to be read and then thrown away—this could affect the format you use. The frequency with which a publication is produced should vary with circumstances and the only general rule is that it should appear so as to meet the requirements of the intended audience. The audience relationship to the printed word is quite different from that to the spoken word. Speech is an important component of many PR activities—it is used, for example, in committee and public meetings and when broadcasting. The words you use in a radio interview, for example, and indeed the way you use them, should be quite different from those you might put in a library guide.

The reception conditions for the audience are also different. It is unlikely that the radio listener will record your talk for posterity so the amount he or she will be able to recall at a later date will be quite small. (How much can you remember from last night's main news bulletin?). Therefore you should plan a radio talk so that you make just two or three key points at most. It is a sound technique, if you will pardon the pun, to attempt to paint pictures in the mind of the radio audience. Thus rather than talking about the 'international availability of books through library interlending services' tell the listening audience that it is possible for someone using the local library to borrow a book from libraries in Washington or Moscow. When appearing on radio—or for that matter television—imagine yourself talking not to an audience of thousands or millions but to one or a few people listening in their own living room. Some people find it useful to think of the microphone as the person they are talking to. You must of course think about what you are actually saying and always think 'talk' words. Some librarians may be reluctant to accept one station manager's advice to 'forget the rules of grammar'. It is good advice nevertheless—anyone who has seen a full transcript of a meeting or unscripted talk will be aware that in a great deal of everyday speech those rules are forgotten.

For some library organizations the spoken word promotion will take the form of a talk to a small audience rather than a radio broadcast. The public speaker is in a privileged position because he or she can take immediate account of an audience's moods. There is reported to be somewhere a picture of Dr Spock (during his liberal period) addressing an audience of New York policemen. The entire audience, it is said, have their arms folded, demonstrating their psychological withdrawal from, and rejection of, the doctor's message. Such simple analysis is rarely possible, but a good speaker will watch an audience so as to 'read' its attentiveness, attitudes and emotions. When speaking in public you must make a constant effort to retain and/or regain the audience's attention. This can be accomplished it is said by a change of subject, the occasional digression or the use of an appropriate audio or visual aid.

Library PR is not simply concerned with selling the service, it has financial, political, industrial, corporate, community and other dimensions. The success or otherwise of a public relations activity does not just depend on the campaign itself, but also on the audience for it. Even when a library has been successful in 'reaching' the public with a message, people still have to interpret that message for themselves. Individual psychological, sociological, and geographical factors will cause some people to discount, distrust, or simply ignore the message. An individual's selective exposure mechanisms can determine just what information he or she pays attention to. It is not unknown for people to avoid actively some forms of information (if you are a smoker how do you react to anti-smoking campaigns?), while others may be simply apathetic. A number of public information campaigns designed to promote some most worthy causes have floundered because of such audience factors. In addition other external factors beyond the control of the librarian can sometimes influence the success or otherwise of a particular campaign.

Such difficulties notwithstanding, public relations is an essential part of library management. It is a management tool for obtaining, retaining and maximizing resources. To quote the marketing manager responsible for the vodka advertisement that introduced our pictures* 'librarians have a major PR job to do'. That was true a decade ago when the advertisement was first introduced, it is perhaps even more true today when so many other institutions are competing for the public purse and the public's attention.

*AUTHOR'S NOTE

My presentation to the conference included about twenty minutes of sound recordings and slides by way of illustration. These and the accompanying commentary have, for obvious reasons, not been included in the text.

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Creating an identity

Patsy Hutchinson and John Kirby

Sheffield City Polytechnic Library

Paper presented at the Aslib Conference 'promoting and publicising library and information services', London, Aslib, 16 March 1981

IN COMMON WITH many other Polytechnic libraries, Sheffield City Polytechnic Library is made up of a number of previously autonomous units, with a wide range of buildings, some new, some converted premises, and a divergent set of traditions and practices. It was important to weld these disparate libraries into one coherent library system and as part of this process it was felt important to develop a corporate identity for the Library.

Corporate identity, sometimes called 'house-style', is really just 'how we do things'. There is nothing magical about developing a corporate identity. There is no mystique involved. It simply requires a little imagination, a little thought, and a lot of care. Every library has an image; whether it likes that image or not is a different matter. In this present visually sophisticated society it is important to consider the library's image and to attempt to present a favourable one to users. It is up to the librarian however to choose this image; whether it is to be one of friendly efficiency or surly chaos.

As an example of corporate identity creating an image in the public mind compare Woolworth's, with its red signs, feeling of crowded and frenetic activity, even in its newest most spacious stores, and Marks and Spencer's, whose cool green and blue graphics present an impression of uncluttered efficiency. You know which one you would rather people saw you coming out of with your shopping. Obviously graphic design is a part of the presentation of this image. Another example of a graphic approach to corporate identity is that adopted by British Rail. By using a standard style of lettering and signing, plus a logo, BR can give a similar feel to stations as varied as Bury St. Edmunds and Euston. Libraries too can use the same techniques to create an image of one co-ordinated service despite a variety of buildings and service points.

Corporate identity creates an image for the Library for three main audiences. Firstly, for the staff; in the case of Sheffield City Polytechnic Library it was used to create a unified staff from five separate groups, to help build a feeling of all working for the same organisation. Secondly for the Library's users; so that whichever service points they use they can feel that it is one coherent system. And thirdly an image is created to a wider world rather than the Library and its immediate community, to other libraries, other organisations, other people; the parcel with the neat address label gives an impression of efficiency which the scruffy felt pen scribbled address does not. A word of warning, however, it is important that the library actually *is* efficient as well as giving the impression of being so; though the development of corporate identity can create a new efficiency too!

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The design of guiding and publications is an important element in developing this corporate identity. It is essential to have clear objectives. In our case these were to:

—provide information
—advertise services
—create a positive attitude towards the Library
—create a sense of corporate identity in the five constituent libraries while retaining individuality.

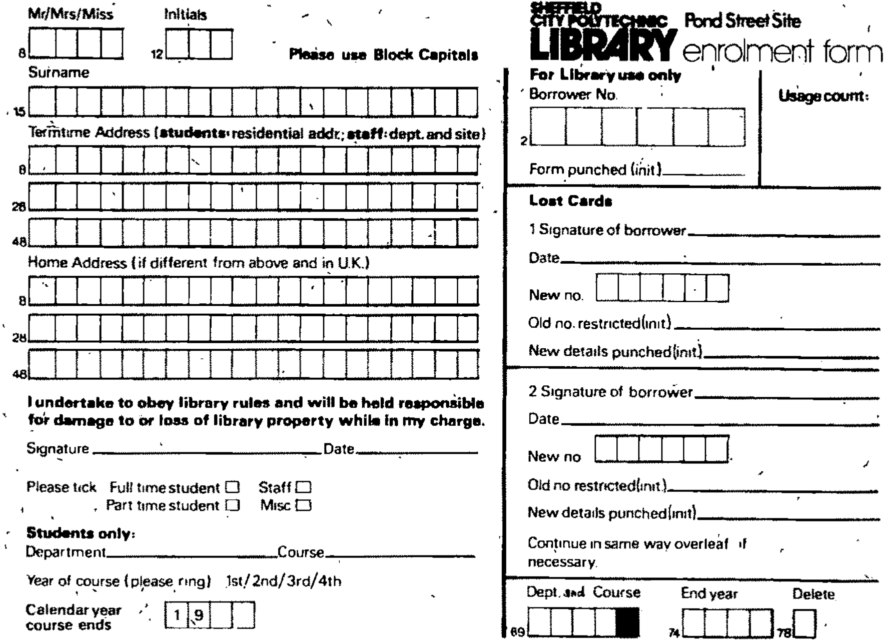
Criteria were established in a range of areas, such as cover format, production standards, materials, layout, use of a logo, and typeface choice. Having established criteria and standards it is important that someone is designated to maintain these and to carry out the necessary editorial function.

In a large system the ideal is a graphic designer working in conjunction with a member of the Library Management team with a division of responsibilities as below.

Librarian	*Designer*
Identifies needs	Prepares costings
Co-ordinates programme	Decides format
Analyses information	Designs and prepares artwork
Interprets for audience	Arranges typing/typesetting
Considers format	Arranges printing (and liaises and chases up printers)
Decides quantity	
Oversees expenditure	Spends budget—materials and printing.

The designer may not be in the library itself, but may be elsewhere in the institution, e.g. college etc. In this case the librarian must also be able to interpret his needs to a designer who may know little or nothing about the library. This can actually be beneficial in that it makes the librarian scrutinise his own objectives and reasoning more closely. Where no designer is available library staff must go further in visualising needs. Get ideas from other organisations, such as banks, stores and large commercial organisations, British Rail, IBM, British Airways etc. Look at advertising, and study layout in magazines and newspapers. It is necessary to be aware of the various reprographic techniques, off-set litho versus photocopying for example, colour or black and white and their capabilities.

Some technical support is needed; someone to actually prepare artwork and produce guiding etc. The main point is to avoid the amateur look associated with wobbly lettering and poor layout. Necessary skills can often be found in the library though may be hidden—a former art student, someone qualified in technical drawing. Alternatively send someone on a short course. Librarians on the whole do *not* normally have the appropriate technical skills. If proof of this is needed look at most libraries' guiding and publications! Copy shops will do layout and printing for you, but may



Mr/Mrs/Miss
8
Initials
12
Please use Block Capitals

Surname
15

Termtime Address (**students:** residential addr.; **staff:** dept. and site)
8
28
48

Home Address (if different from above and in U.K.)
8
28
48

I undertake to obey library rules and will be held responsible for damage to or loss of library property while in my charge.

Signature ______ Date ______

Please tick Full time student ☐ Staff ☐
Part time student ☐ Misc ☐

Students only:
Department ______ Course ______
Year of course (please ring) 1st/2nd/3rd/4th
Calendar year course ends 1 9

SHEFFIELD CITY POLYTECHNIC LIBRARY Pond Street Site enrolment form

For Library use only
Borrower No.
2
Form punched (init) ______
Usage count:

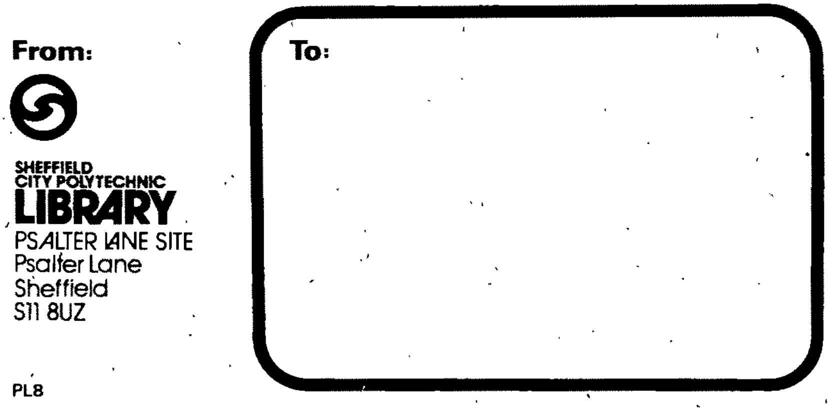
Lost Cards
1 Signature of borrower ______
Date ______
New no.
Old no. restricted (init) ______
New details punched (init) ______

2 Signature of borrower ______
Date ______
New no
Old no restricted (init) ______
New details punched (init) ______

Continue in same way overleaf if necessary.

Dept. and Course 69
End year 74
Delete 78

FIG. 1. *Example of library stationery*



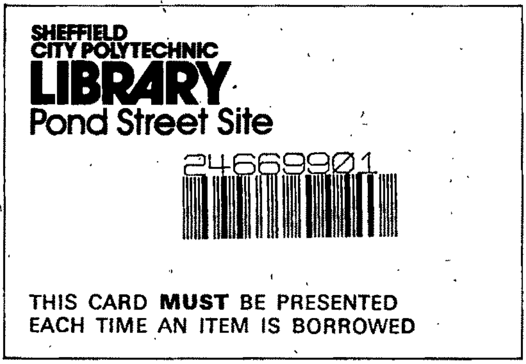
From:

SHEFFIELD CITY POLYTECHNIC LIBRARY
PSALTER LANE SITE
Psalter Lane
Sheffield
S11 8UZ

PL8

To:

FIG. 2. *Library address label*

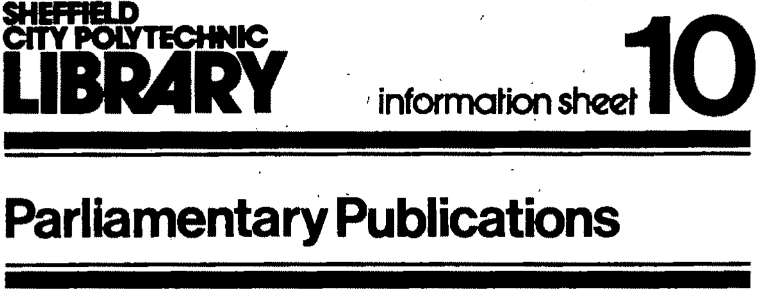


SHEFFIELD
CITY POLYTECHNIC
LIBRARY
Pond Street Site

24669901

THIS CARD **MUST** BE PRESENTED
EACH TIME AN ITEM IS BORROWED

FIG. 3. *Library ticket*



SHEFFIELD
CITY POLYTECHNIC
LIBRARY information sheet **10**

Parliamentary Publications

FIG. 4. *Information sheet heading design*

appear expensive. Compare these with the hidden costs of the library's staff time and compare too the final results.

Below are the salient points from our design policy document, interspersed with some comments and amplification. The above illustrations (Figs. 1–4) should further elucidate these and other points.

1. The objectives of the policy have been outlined above. It is important that objectives are agreed with and backed by senior management and that all staff are aware of them.
2. Although each of our site libraries has individual needs and caters for different student types, conformity of presentation is important and all publications, guiding and stationery should conform to the overall specifications.
3. Every publication should be produced in a manner and method consistent with its purpose. A high quality of production must be maintained as this reflects the service it represents.

3. All publications and guiding must have a strong visual appeal in imaginative design and in the way the information is presented.
5. There should be a continual critical analysis of all productions, particularly as to the format of future publications and the effectiveness of past ones, with a regular review of the whole programme.
6. Specifications
   a. Library logo to appear on all publications

      Typeface: *avant garde gothic bold*
      Position: top left corner
      Colour: black
      Size: to be photographically enlarged or reduced as required.
   b. Typeface for text etc.
      Library guiding: helvetica medium.
      Publications:
        Headings: Univers 72, 24pt
        Text: Diplomat 12pt
        Bookface 12pt
        Univers 12pt
        Helvetica medium 12pt
   c. Colours.
      Information sheets have a colour coded stripe.
   d. Size.
      Artwork for publication should be prepared in A4 size.
      A5 publications should be photographically reduced from A4 original art.
      A5 should be used for information sheets
      A4 should be used for bibliographies etc.

The examples in Figs 1–4 have been chosen to further demonstrate these points in practice.

The German experience: a case study in library promotion

Horst Ernestus

Director, Wuppertal City Library

An illustrated paper presented at the Aslib conference 'Promoting and publicising library and information services', London, Aslib, 16 March 1981.

During recent years perhaps the most apparent contributions to library public relations in the Federal Republic of Germany were some approaches towards a corporate visual identity for a public library system or—more ambitiously—all public libraries in the country. A series of colour slides illustrated the graphic conceptions developed for and consequently applied by the city libraries of Cologne and Wuppertal as well as a more recent project undertaken by the German Library Institute and financed by a Federal Government grant. The slides also indicated the wide range of materials to be considered. In an introductory section it is stressed that any graphic contributions should be seen in context with other single aspects of Library PR and must also be based on an integrated PR policy in line with a library's goals and objectives and the image desired.

Introduction

FOR CENTURIES MISSIONARIES have come from the British Isles to Germany to teach us Christianity and—after the last war—democracy as well as a different philosophy of public librarianship. Among other achievements it brought to our public libraries and their patrons open access and light fiction. German librarians learnt from their British colleagues to worry less—about readers getting lost among book shelves, or, mentally and morally, among 'Love, Crime and Cowboys'. As a matter of fact, the new philisophy and practice worked well, Instead of losing patrons, we gained millions more and thus we owe a lot to British librarian missionaries. It remains to be stated, that by no means *all* is well with library public relations in Germany, although we may have scored a few points here and there. I shall therefore concentrate on some practical approaches taken in the Federal Republic of Germany towards integrated graphic conceptions seen within a broad framework of an integrated PR strategy. Table 1 indicates from a practical angle basic and individual aspects of public relations for a library and this paper will develop the themes presented in the table.

Analysis—goals and desired image—PR conception.

There are many ways and means for library promotion and public relations. Any single effort should be seen as an integral part of an overall policy. Such a conception should reflect the goals and objectives a library sets out to achieve, the emphasis on

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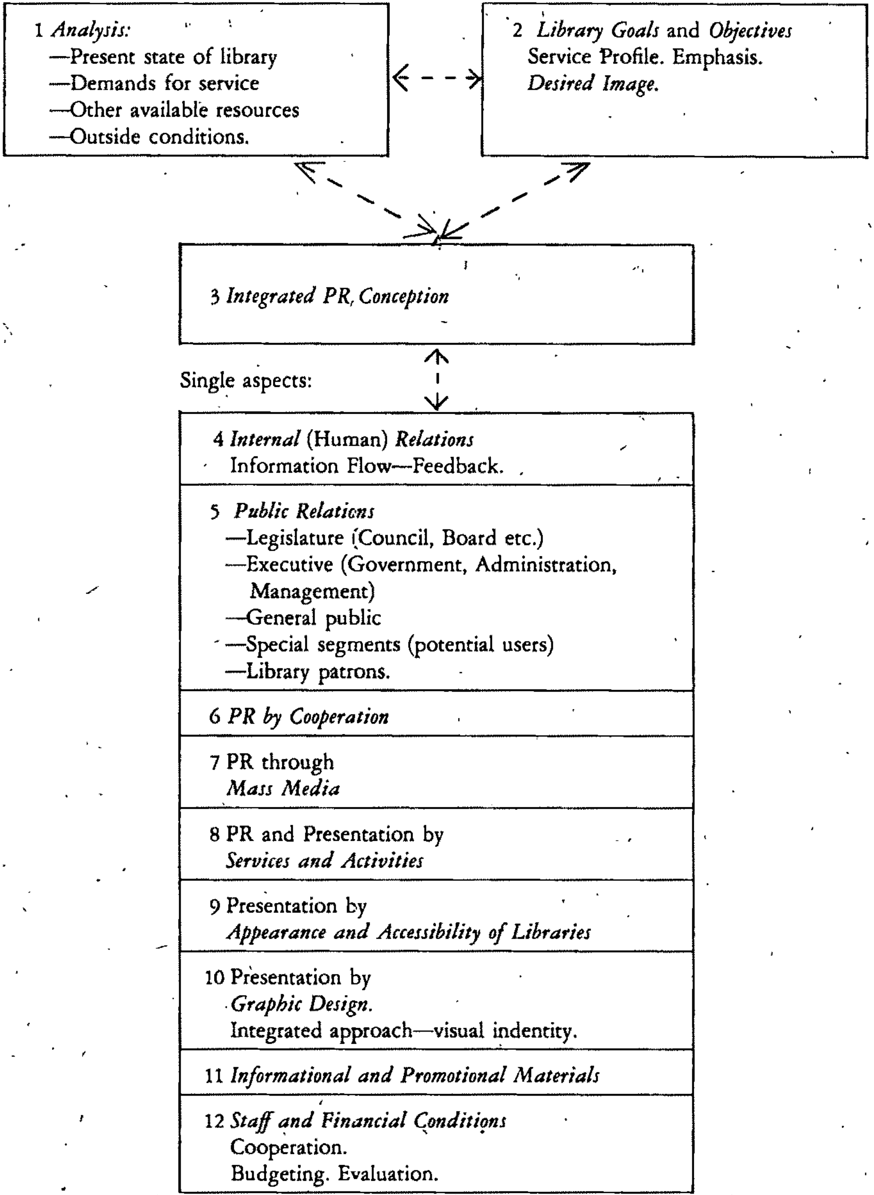
TABLE 1. *Public relations for a library*


1 *Analysis:*
—Present state of library
—Demands for service
—Other available resources
—Outside conditions.
2 *Library Goals* and *Objectives*
Service Profile. Emphasis.
Desired Image.
3 *Integrated PR Conception*
Single aspects:
4 *Internal* (Human) *Relations*
Information Flow—Feedback.
5 *Public Relations*
—Legislature (Council, Board etc.)
—Executive (Government, Administration, Management)
—General public
—Special segments (potential users)
—Library patrons.
6 *PR by Cooperation*
7 PR through *Mass Media*
8 PR and Presentation by *Services and Activities*
9 Presentation by *Appearance and Accessibility of Libraries*
10 Presentation by *Graphic Design.*
Integrated approach—visual indentity.
11 *Informational and Promotional Materials*
12 *Staff and Financial Conditions*
Cooperation.
Budgeting. Evaluation.

certain services and activities, those groups or individuals to be served. And consequently the PR policy should be in tune with the image the library aims for. To set the library's course requires a more or less continuous analysis of its present state and position (of which an outstanding tradition may be an eminent element), an analysis of the actual and potential demands on its services and activities; it requires extensive and reliable knowledge of other available resources in order to avoid unjustifiable duplication, it takes an awareness of prevailing outside conditions such as social or educational changes, the economic situation, political trends.

There should be a constant feedback between analysis, goals and objectives and PR policy; I think that adjusting a library's course from time to time, taking advantage of fair winds and taking precautions in heavy weather, is demanded and will effect the tasks we see, the image we hope to project—and thus the public relations we should pursue. Feedback must exist between the overall conception and the individual aspects of library public relations and I shall briefly deal with some of these aspects based on a selection arrived at by personal experience in libraries of the Federal Republic, a selection which therefore might perhaps be challenged by others with a different background.

Internal relations

Public relations start at home. A library's reputation is based on its resources and services and not the least on the attitudes and performance of those working—in one capacity or another, in the spotlight or behind the scenes—to make them accessible or available. There is the obvious encounter of staff and patrons, which *are* people and will respond positively or negatively, and there are many more day by day private encounters of staff members with individuals and the publics outside the library.

A library's *internal*—human—relations, the internal flow and feed back of information, insight and participation in reaching decisions and formulating policies are therefore a decisive factor for relations which the *public*. Only staff members who are well informed about their institution *can*, only those who are convinced *will* tell the library story the way one expects them to. Some years ago during a Library Association Conference at Eastbourne a British librarian insisted, that any library was in bad shape whose chief librarian would be addressed 'Sir' by his staff. Others felt, however, a chief might be called something much worse.

Relations with the public

Public relations in a narrow sense—relations with the public—are an obvious aspect. One must be sure, however, to think not only of the people, groups or institutions using the library already, those being potential users or even the public at large. Among the library's public—or publics—members of the legislature (council, board etc.) or the executive (government, administration, management) are extremely important. And not only the leading figures, those in senior positions: Opinions are being formed, decisions prepared on all levels.

So in addition to its professional standards and services the library should impress by good management, an economical approach, soundly based requests for staffing and financing, and convincing arguments properly presented. We should create goodwill by adhering to the written and unwritten rules, by an understanding and appreciation of the professional or political know-how, attitudes and positions of those who are our partners or counterparts in decision making and executing, those to whom we have to present our case time and again. In any case we should resist the temptation to try the game of oneupmanship on them. Instead it pays to establish friendly personal relations, to be helpful, to take and seek the various opportunities for meeting people how ever much we feel we cannot really afford the time. I am not sure, however, to what extent P.H. Welsford, a former Secretary of the Library Association was right, when he explained to me that pretty much all the chief librarians in this country were males, insisting that this was just as well because all the important negotiating was done over a drink in the pub in which in those good old days lady librarians could hardly stand up even if they were admitted ... I also wonder if in one's relations with the public one has to go as far as the Prague City Libraries which proudly informed an international gathering of librarians that they were very successfully operating what they called—and I quote their official English translation—'a special department for intercourse with readers'.

However, I fully agree that we must not only keep our patrons informed about the library's services but that we should try to establish a two-way communication. Apart from regular contacts through service even the occasional complaints we get may provide a positive opportunity for informing, explaining and responding, as may notebooks and large blackboards inviting patrons' suggestions and criticism to be answered openly by the library. They attract much attention in my own library.

Public Relations by cooperation

At least *public* libraries should be prepared to cooperate with other institutions—inside and outside the cultural and educational sphere or their particular field of specialization. In fact they should be on a constant look-out for partners and opportunities, for activities, from which both sides can benefit. It may be an exhibition, a programme, a joint publication, or the exchange of printed information. It may concern advertising space or the display or distribution of promotional materials. Partners could be an educational institution, a kindergarten, a theatre, a museum, a zoological garden, a publisher, national railways or airways, a church community, a club for amateur photographers or stamp collectors, a local bank or a foreign embassy, consumer associations and local history societies—to name a few.

Through such cooperation a lot of goodwill can be achieved for the library, among individuals and groups, more potential users may be reached both directly and indirectly, and the library, aided by such interested partners, may increase its informational capacity, its extension work or its promotional opportunities beyond the limitations of its manpower and financial resources.

My own library owes much in this way to such cooperation, not the least the financing of publications and some rather prominent visitors—among others: authors, artists, foreign ambassadors and the last two Presidents of the Federal Republic when they were in office. Great publicity indeed—and at no cost.

PR through mass media

Reaching the public through press, radio and television is an obvious PR goal—at least for libraries concerned with the broader public in one way or the other. To be successful, we must learn the ways of those media, put ourselves in the shoes of those who work in them, carefully prepare any information we hope to be printed or broadcast. And we must watch the changing scene: newspapers disappearing, small local, sometimes 'alternative' publications mushrooming and fading out, a growing emphasis on local or regional radio and television programmes, cable tv—and the future role of libraries within such new patterns of one- or two-way communication.

As to the press: a picture may get more attention than a lengthy article, so it is important to be on good terms with newspaper photographers. VIP's and politicians visiting the library may very much expect to have their picture taken. By mere chance, I can give you a very simple example. When we expected the Israeli ambassador to open one of our exhibitions, a class of student photographers had asked whether they might take this opportunity for a class exercise. I had forgotten all about it and upon entering the lecture hall with our prominent guest was stunned to find some twenty instead of the usual two photographers clicking their cameras. I am sure the ambassador will remember Wuppertal and its library as a place where you get proper attention.

PR and presentation by services and activities

The soundest promotion will be achieved by satisfied users, no doubt. As librarians we will be service-minded anyway, the better our service, the wider the scope of our activities, the greater our chances to reach a large public and to ensure its support. At the same time we must see our limitations and we must convince that what we do is indeed our business.

Sometimes one feels that the very core of our work—building media collections, advising people how to use them, providing bibiliographical and factual information—is a matter of course, needs no publicity and is very difficult to publicize anyway. And indeed, we often find that some of our other more, shortlived activities such as programmes and exhibitions get much more attention. But although many may take at least our basic services for granted, we have to realize that there are probably still too many individuals and institutions who are not informed, and are not encouraged or motivated to use them. And we should realize in all modesty, that we do have much to offer; so much often, that not even our regular patrons will know all about it. Thus taking the trouble to print a somewhat detailed checklist of all our services and activities for different types of users and their varying requirements and approaches, put down in very practical terms, may result in a quite convincing piece of promotion.

The story of a library is the story of its services. They may speak for themselves to those who use them. But we must learn to tell this exciting story to the rest who should also know it.

Presentation by appearance and accessibility of libraries

One aspect in our context which we felt needed increased attention and constant updating is the presentation of a library by its outside and inside appearance and by the extent to which its service areas and collections have been made inviting and accessible to the different types of users—adults, children, senior citizens, immigrant workers—and to even the unfamiliar visitor. So a few years ago, a working party on library presentation—comprising architects, an interior designer, a graphic artist, an AV specialist apart from librarians—was set up by the German Library Institute. Its objectives have been to consider some new appeoaches in line with present public library goals as well as to make librarians and their partners more aware of the effects and interdependence of architecture, interior and graphic design including guiding systems and thus the need for close cooperation. The various aspects were dealt with in a first publication entitled: 'Die Präsentation der Öffentlichen Bibliothek'. (The Presentation of the Public Library), which appeared in 1977. A second and third volume are expected to be ready for publication later this year. They will concentrate on the presentation of children's libraries and contain first chapters on larger central libraries.

I feel, we have learned a lot from each other in this group and received many useful suggestions. Obviously I cannot begin to discuss this theme in any detail. Just let me very casually mention the signs we put up in our libraries. They are one way in which we present our institution, one way in which we determine its climate. Graphics are an important aspect of signs and there is the problem of communicating, for example, any regulations. Signs forbidding smoking might best be done as pictograms. Explaining the reason for 'no ice creams, please!' in a children's library may be successfully left to some of our young patrons. 'Don't wet your fingers before turning the pages' was glued to all books added to the Wuppertal City Library before my arrival in 1973. I stopped it. But I wish they would—and I am sure they will—keep that fading notice in the Victorian reading room of the National Library of Ireland: ' Please remove gloves before examining these books.'

Presentation through graphic design

The presentation of libraries through their graphic design has received much attention in recent years. There have been individual posters, bookmarks or carrier bags in some of the libraries and it was possible to get them without cost by accepting commercial advertising. Then EKZ, the central purchasing centre for public libraries at Reutlingen, offered plastic bags and one or two other promotional aids carrying a library logo. In addition it commissioned several series of posters from different artists.

The first public library to recognize the importance of an integrated approach to design was the Cologne City Library. In the early seventies it asked a well known graphic designer to develop over a period of three years a corporate visual indentity for the library service. The City Library of Wuppertal followed the example in cooperation with a local graphic design team. A number of other libraries in the Federal Republic joined in the production of some of the resulting promotional materials and later EKZ asked the Wuppertal team to create posters and other promotional aids along similar lines.

Although the Cologne and Wuppertal conceptions have established themselves, a third approach was taken in Berlin, where in 1979 the German Library Institute set up a working group in order to develop a new scheme to be tested by public libraries in West Berlin during 1981 and later to be available to all public libraries in the Federal Republic through EKZ. Financed by a substantial federal government grant the new scheme was designed by a prominent team of graphic artists from Mainz.

All three of these approaches are based on the recognition:

—that corporate identity through graphic design can play a very important part in library public relations,
—that an integrated concept must reflect the library's overall PR policy,
—that once developed the scheme must be flexibly but strictly adhered to.

Basic graphic elements are colour, letter type, logo or label to be applied according to a set of rules. To what extent the design scheme suggested by the German Library Institute will be accepted by public and perhaps school libraries in the Federal Republic remains to be seen. In spite of possible mass production, the various realizations will not be cheap and any further additions and variations which will be required after some time may be even more expensive without the initial government grant. Even now individual libraries will have to find out whether the range of available materials will meet their needs, what flexibility they have in their application and adjustment to particular needs. And they will have to see if their authorities will accept a national design scheme or whether some will continue to insist that their libraries show their community's flag instead.

Informational and promotional materials

The slides in this presentation may also indicate that there is a vast range of materials libraries may produce, materials which are relevant to their PR efforts and in promoting their corporate identity. Perhaps one could emphasise the following categories of material:

—Printed or audiovisual materials with an emphasis on *informing* about the library and its services (e.g. directories, guides, newsletters, reports, posters, cassette tapes).
—Printed or audiovisual materials with an emphasis on *motivating* and *encouraging* library use (e.g. posters, programme announcements, stickers).
—Materials to be used as *gifts* and *prizes* or for *sale* (e.g. posters, postcards, maps reproduced from library holdings, publications, note pads, calendars, games, puzzles, carrier bags).
—*Stationery* (e.g. borrower cards, letters and envelopes, postcards, complimentary cards).

Some of these may be particularly designed to reach certain segments of a library's public such as children, senior citizens or immigrant workers and their families.

Staff and financial conditions

As a last single aspect I should like to touch on the staffing and financing of a library's PR programme.

Seeing library public relations as an overall effort, as we have done so far, it becomes obvious that much of it does not require special personnel and financial means. In fact, much of it cannot be bought by money at all. Other parts of this conception, however, require staffing and financing. Both should be provided in recognition of the vital importance of PR for an effective and thereby economically justifiable service. But it does not necessarily take a PR department, as long as certain tasks can be dealt with by the librarian or various staff members. Altogether, motivation, certain skills and some creativity play a major part. As to funds, it may also be possible to draw on several budget positions according to the type of activity involved or the kind of material to be produced. Some publications may be sold or partly financed by advertisements.

Staffing and financing library PR may become easier, if it is planned and accepted to be part of community, university and company public relations. Their PR or press and information officers can give the librarian most valuable advice and assistance. Cooperation with other agencies—as mentioned earlier—as well as among libraries may very much relieve our own burden and provide great possibilities. Once we have established our potentials for a fiscal year, some advance planning is advisable and we may even take a long term approach.

Evaluating the effectiveness of our public relations should be done continuously and further planning adjusted. There is a more practical way of judging the value of certain PR activities. It cannot claim to be a 'method' and it will appear quite unsatisfactory to PR professionals. However, since we are very much in the early stages of library promotion in Germany, I do not know of any library there that has done it otherwise. The Wuppertal experience has revealed cases where we failed in the planning or the execution of projects and it has involved a fair share of disappointment. On the whole, it has strengthened my conviction, that active PR can in fact play its positive part in a spiral of promotion—recognition—reward—development—further promotion . . . as displayed by Blaise Cronin. I trust it will also prove its value in a time of depression, when it may be advisable to keep a low profile and when it may be a great achievement to merely keep the ship afloat.

A challenge worth accepting

I have shown you a selection of factual and promotional materials, some signs and stationery developed in the Federal Republic of Germany—developed as integral parts of graphic design systems, aiming to achieve a corporate visual identity for an individual library system or—more ambitiously—our public libraries.

Somebody in your country may follow—or may even have preceded—the American idea of setting up a PR INFOBANK as recently announced by the American Library Association, thus enabling libraries to borrow PR packets on different topics. If Aslib or any other association should do so, I am sure libraries in my country would be more than willing to send any samples you might be interested to include.

In my introduction I tried to make the point that any adventures in graphic design undertaken by a library—or a group of libraries—should not be seen in isolation but should be part of an overall PR strategy, a programme in line with a library's goals and objectives, the desired public image. And I hope to have left you with the impression, that motivated librarians and staffs, some brainstorming resulting in imaginative planning, contacts and cooperation with a variety of partners, will open doors for some successful PR in spite of the limitations set by our inadequate personal and financial resources.

In ending, I would with Betty Rice, consider library public relations to be 'a constant process of problem solving, a way of life'. Indeed, one may very well be reminded of the old wisdom that: 'A man may live long, very long. He may even live for 150 years—and yet he will never be able to do all the things his wife expects him to.' But, there is no doubt that PR is a challenge quite worth accepting. And time and again it is jolly good fun!

EDITOR'S NOTE

The presentation to the conference included a series of slides illustrating examples of graphic design used in libraries in the Federal Republic of Germany to achieve a corporate visual identity. The illustrations and the accompanying commentary have not been included in this article.

Letter to the editor

ABSTRACTING AND INDEXING SERVICES

Ms Rickman's paper on 'Abstracting and Indexing Services in Planning' (*Aslib Proceedings* 33 (5) May 81, p. 210) will have been missed by many who aren't interested in planning which is a shame because it is an excellent paper on abstracting; so much so that my advice to the author would be to re-issue it in a more generalized context. Just *because* it is such a good paper, I think she should be taken to task on a few points.

To commence, on p. 211 Ms Rickman tells us that *Ulrich's International Periodicals Directory* lists 62,000 journals of which 50,000 are in the English language: that is no doubt so (I haven't checked but have no reason to doubt her word)—but it is inadvertently misleading as many a reader will conclude that 5 out of every 6 periodicals are in English, and the non-English speaking world produces no more than 12,000. Certainly, Ms Rickman hasn't said so and the facts of the case are, of course, that *Ulrich* is much more highly selective when it comes to Serbo-Croat or Japanese publications. And rightly so.

The language barrier is a problem we have grappled with for twenty years in ANBAR, and whilst we do not claim to have found a way of removing it, we have over the years developed a method that at least copes, to a point, and which enjoys a fair measure of acceptance. On our core subjects, we peruse a selected list of foreign-language journals: from them we abstract those articles which not only satisfy our general selection criteria but also the additional one that similar contributions are not available in English, the reasoning being that few readers will wish to see a Swedish paper on a subject on which most librarians can produce a dozen papers in English in a few minutes. This means that this is a high-input/low-output job, and therefore costly: but the quality of the output is high, and it makes a real contribution particularly as we also have an English version prepared which is then available to those whose appetite has been whetted by the abstract (I'll come back to them shortly). We take it as an endorsement of this approach that we were recently able to sign a contract with ABI/INFORM, the US database run by Data Courier Inc., of Louisville, Kentucky, for the use by the latter of that small part of our output which comes from foreign-language sources.

It is on the need for abstracting services, and on what constitutes a good abstract, that I consider Ms Rickman makes her major contribution: if only more people understood what she says, life for us abstract producers would be easier. And yet, I feel I must disagree with her on two aspects.

The first is when she says (still on p. 211)

> 'A good abstracting service can alert (the busy worker) to important research findings and useful information that he would otherwise miss. In some cases, having read the abstract, he will want to see the original article, ***but in many cases a good abstract will save the time he would have needed to read the original.***'

(The italics are mine.)

No, it will not. I go further and say, if it does, it's not a good abstract (it may also infringe copyright, but that's another issue).

Our second disagreement comes when Ms Rickman says (on p. 212) that

> 'a good abstracting service will be exploited retrospectively for information retrieval . . .'

—yes, of course, particularly as without such 'exploitation' many services would be quite uneconomic—,

> *'and this you may consider its most important function . . .'*

(my italics again). This is not the case: not unless you are prepared to consider a good lost property office the most important function of a bus service. An important function, yes; *the most* important, no. The distinction is vital, because unless such distinctions are made you get all sorts of tails wagging their respective dogs.

This view of mine does *not* contradict the Collison quote on p. 213 with which I fully agree. At ANBAR, much of our effort goes towards ensuring that our abstracts are fully indexed and *can* be exploited—but a spin-off is a spin-off is a spin-off.

With these minor reservations I commend Ms Rickman's paper to those who had not planned to read it.

Harry P. Cemach
Chairman, Anbar Publications Ltd

NEW TRENDS IN DOCUMENTATION AND INFORMATION

Edited by PETER J. TAYLOR, Aslib

Proceedings of the 39th FID Congress,
University of Edinburgh,
25–28 September 1978

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The 39th Congress of FID was widely regarded as being held at a critical time in the Federation's history, and the delegates present at Edinburgh University in September 1978 were asked to give special attention to FID's future role and objectives. The meeting of the General Assembly in Mexico in 1976 had agreed that the 39th Congress should provide an opportunity to take stock of where the Federation stood, and to consider in which directions it should go to serve its professional membership and fulfil its role internationally. This arose from a consensus that the growth of activity of the professional bodies worldwide had only increased the need for a body like FID to focus on the requirements of those engaged professionally in documentation and information.

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Aslib and the Translators' Guild

PRACTICAL EXPERIENCE OF MACHINE TRANSLATION: A CONFERENCE

5–6 November 1981

Scientific Societies Lecture Theatre,
Fortress House,
Savile Row,
London W1

21 OCT 1981

Following in the wake of two successful co-operative efforts of the Aslib Technical Translation Group and the Translators' Guild of the Institute of Linguists—**Translating and the Computer** in 1978 and **Machine Aids for Translators** last November—comes **Practical Experience of Machine Translation**, a somewhat more ambitious project, jointly sponsored by Aslib and the Translators' Guild.

The theme of this conference, which should attract translators, administrators and computer people in government, institutions and industry, academics, promotors of MT systems, MT users and potential users, is machine translation (MT) in practice rather than theory. Its object is to gather and disseminate information on the state of the art in machine translation in Canada, the USA, the Soviet Union and the Far East, as well as Europe. Speakers in the core sessions will be practitioners (mainly translators) who work on MT systems in regular practical use, and their remarks can be expected to indicate MT's current vices and virtues. The scene will be set by a partly theoretical introductory session and the concluding session, taking a speculative look at innovation and its limits, should suggest where to concentrate future research and marketing.

The programme for this event, including full details of sessions and speakers and a registration form will be issued shortly. Contact for information and enquiries:

The Conference Organiser, Aslib, 3 Belgrave Square, London SW1X 8PL.

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Aslib Proceedings

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Aslib one-day conference, London, 4 June 1981

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ASLIB PROCEEDINGS

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Aslib Proceedings carries papers given at Aslib meetings and conferences, and contributed papers of interest to practising professionals. These describe innovations in information management techniques, applications of existing information products and services, and case studies of information units and special libraries. The contents of the journal are reviewed by an editorial board.

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Current affairs information: Chairman's opening remarks

David Menhennet

Librarian, House of Commons

Presented at the Aslib Conference 'Current affairs information—resources and needs', London 4 June 1981

THE CONFERENCE SESSIONS are entitled 'Instant Information in a Changing Scene'. You will not need me to tell you that 'current affairs information' and 'instant information' are not necessarily always one and the same thing. If I am asked the exact date of the Battle of Trafalgar, and am able to reply at once, then I am giving instant information, but not on a topic of current affairs. Alternatively, on being required to find the very latest official Government statement on a particular subject, and on being given half a day to do so, I am handling a current affairs enquiry on a far-from-immediate basis. A very obvious distinction: but one which I know we shall bear in mind throughout today's Conference.

It remains nevertheless true that Current Affairs Information *is* normally required very quickly, and quite often immediately. What we shall be discussing today therefore is the *collecting, organising and provision of precise and accurate information over a very wide range of current and recent affairs, and which usually is required at short or very short notice.*

This task is not new. In 1835 one of my predecessors at the House of Commons Library told a Select Committee that 'there is no subject connected with parliamentary business . . . on which I am not called upon to afford instant information'. But we are here to discuss resources and needs 'in a changing scene': against a contemporary background of enormous and continuing expansion in the amount, scope and complexity of current information, all of which needs to be 'managed'—in the best professional sense of that word. This 'changing scene' embraces not only the available funds of raw and processed data, but also those modern methods of information technology which have combined with the more established channels of communication to make today's librarian—or anyone else engaged in providing current information services—more of an information specialist than ever before.

Aslib Proceedings, 33 (11/12), November/December 1981, p.417. Printed in Great Britain.

Current parliamentary and government legislation, prospects and events

C. C. Pond

Public Information Office, House of
Commons Library

Paper presented at the Aslib conference 'Current affairs information—resources and needs', London, 4 June 1981

Introduction

'CURRENT AFFAIRS INFORMATION, Resources and Needs' is the title of the Conference, and its wily sub-title is *Instant Information in a Changing Scene.* I am always suspicious of sub-titles—'Tess of the D'Urbervilles—*a pure woman*:' 'Twelfth Night or *What You Will'*—the sting is always in the tail, and the subtitle often seems more important than the actual title. So is 'instant information' the theme of this Conference, or is its relegation to a subtitle an indication that it is a pious hope behind the more prosaic 'current affairs'?

In the field of the interpretation of Parliament to the outside world 'instant' sometimes takes on a rather nineteenth-century feel. There is certainly no ready-made databank from which we can get an answer to every question about what Parliament or the Government is doing. The result is quite often that information about Parliament is 'current' but not 'instant', but having said this, I think the situation in 1981 is radically better than in 1971, only ten years ago. This deficiency is certainly not the case *internally.* Nearly 30 years ago, the House of Commons Library took steps to create tools for the giving of 'instant' information—for example to a Member who had run the fifty yards between the Chamber and the Library to check some fact of parliamentary point, 'While the Minister is still on his feet'. These were the unique set of visible indexes by which the Library's whole ready-reference system worked and which are only just being replaced.

There is no doubt that the technology exists whereby the result of a Division in the House of Commons, for example, could be keyed in by the officer recording it, and could be very rapidly and probably automatically formatted in a dozen different ways: made to generate the House's procedural record, the file of information for Members, give voting records for the Whips, and be pumped, via Prestel, to every home in the country that wanted it.

Or the text of a Bill could be keyed in by the parliamentary draftsmen and maintained on line for general reference, from the time the text became public knowledge, to the day it became law—and thereafter as it was amended, until its final repeal.

Such developments are however, for the future, and however much I personally would welcome such innovations, I don't, realistically speaking, think such things are likely in the near future, though we do now have POLIS (of which more later) and I understand there is a strong possibility of *Statutes in Force* being made available

Aslib Proceedings, 33 (11/12), November/December 1981, p.418–426. Printed in Great Britain

online. So I will confine myself to trying to advise how you can keep as up to date as possible by using the sources available in 1981. I guess from the attendance list that most of you are practitioners of the information art: what I have to say therefore is generally of a practical rather than a theoretical nature.

Parliament has three main functions. It is the vehicle by which *legislation* is enacted; it is the place where the actions of Government are *scrutinised*; and it is the place which authorises the collection of taxes and release of funds to pay for the work of Government. So apart from the last (which is under investigation and may be changed soon) I will deal with these functions and say how to keep abreast of developments therein.

Legislation

Parliamentary processes refer to each of these functions in rather different ways. But it is the process of legislation which attracts the most attention. In the P.I.O. by far the largest proportion of enquiries concern Bills—their passage, and what goes before and after them. Since Government Bills are the most important, and the ones which attract most attention I shall spend a few minutes on how they pass into law and how to keep up with them.

Prelegislative stages. The first 'notice' of impending legislation occurs, of course, often in the *Manifesto* of the Party winning a general election, as affected by any subsequent event. It is then up to the Government what legislation is to be introduced and on what timescale within the Parliament. Naturally, new problems will occur over a five year life of a Parliament, and will have to be dealt with as they arise.

In the *Queen's Speech* (reproduced in daily newspapers and *Hansard*; and summarised in *House of Commons Weekly Information Bulletin*) is outlined the programme of Government legislation for the Session. Again this is not a watertight indication of what will come up—measures may be dropped through lack of Government time, or through a change in circumstances; and the phrase carried in every Queen's Speech 'Other measures will be laid before you' covers a multitude of matters.

Pressure Groups, trade associations, professional bodies these days seem to claim a right to consultation formal or informal before legislative proposals are formulated. In the past, one could imagine that this might have been accomplished in for instance the case of a Bill on the medical profession, by a senior civil servant, or a junior minister 'having a quiet word' with a senior man in one or two of the professional bodies in his club. But nowadays such bodies and other besides would be consulted in the initial stages in writing or at a series of meetings, and strong opinions accommodated if possible before promulgation of the actual proposals.

The first *published* indication of impending legislation is often a *Consultation Paper*. Quite often the way is paved for this by anticipatory remarks in ministerial speeches, departmental press releases or arranged Parliamentary Questions. Sometimes the Department will publish its proposals in the form of a *Green Paper*—that is a priced HMSO document which appears on the *H.M.S.O. daily list* and on HMSO Prestel as a Command Paper—occasionally as a non-parliamentary publication—and in the H.C. *Weekly Information Bulletin*. Sometimes however, consultation papers are not published through HMSO, and in this case, their advent may go almost unnoticed. There may be a written P.Q. in Hansard mentioning the paper's existence or it may just appear. Sometimes they are departmentally published and sometimes just 'made available'. A good example not so long ago was a Government Green Paper on teacher supply in Scotland. This was a piece of duplicated typescript. It appeared in no list of publications. As far as I know there was no press release; no press conference. The House of Commons Library often gets to know of these mainly because Departments tend to send copies to be deposited for Members, but it is dubious whether some of these can be deemed to be 'published' at all.Those which are will no doubt be available through the Chadwyck-Healey Non-HMSO publications catalogue and microfiche, (the catalogue is published and updated every two months) but the principal source for knowing reasonably quickly of the issue of this common type of paper is the *Weekly Information Bulletin.*

The next stage is the *White Paper* which is prepared when feedback to the consultation paper—if any—has been collated and evaluated. These are Command Papers, which set out firm proposals. White Papers do not always follow the Consultation Document, and quite often you get a White Paper without a formal Consultation Document—issue of White Papers also figures in the *Bulletin.* A *Bill* will then be drawn up.

Bills are composed by *Parliamentary Draftsmen* (also known as *Parliamentary Counsel*), who are civil servants, on the instruction of and in close liaison with, the Department of the Government concerned. It will naturally embody the policy of the administration. It may also embody the recommendations of a Royal Commission or Departmental Committee; and the text of the Bill will have been worked on and changed considerably during consultations *within* the Government, and possibly in Cabinet Committees.

The Bill is then presented to the Commons—this is always a formality if it is a Government Bill, and we get to know only the same day. The Bill is printed usually 2–4 working days after the First Reading and details are given in the *Daily List* and *Bulletin.* Each Bill has an HC Bill Number. The Second Reading takes place only after the Bill has been printed; there is an unwritten rule that two weekends must elapse. This is a debate on the principle of the Bill. The decision as to when the Second Reading should take place is made by the Whips and the earliest public announcement is made on Thursday afternoons when the following week's business is announced. There is no set time within which a Second Reading must take place. After the Second Reading the form of the Committee stage is decided. This can be a Standing or Select Committee, or the Committee of the whole House. In most cases the Bill is sent to one of the twelve Standing Committees nominated for the purpose and which reflect the political composition of the House. Members of Standing Committees are given in the *Bulletin.*

Once the First Standing Committee meeting has taken place details of future meetings are given in the *Bulletin.* Amendments to Bills cannot be put down before Second Reading unless the House so resolves, but thereafter they appear in a section of the Daily Vote Bundle called *Notices of Amendment. Procceedings of Standing Committees* is a section of the *Vote Bundle,* to which I will refer later, which gives details of all amendments proposed and the decision made on them. The Bill is then reported to the House with or without amendments—notice that this has happened is given every Saturday in the *Bulletin.* The Bill is then reprinted if it has been amended, with a different Bill number. The Bill returns to the floor of the House for the report stage. This is the last stage at which amendments can be made. There then follows the Third Reading. This is usually short, and amendments cannot be made. The Bill goes to the House of Lords and has to go through much the same stages there.

The papers one needs to keep really up to date with what is happening in the way of amendments proposed and made are in the *Vote Bundle.* The *Vote Bundle* is a collection of papers issued each sitting morning. HMSO charge outsiders 7p per page for it—on average £11.50 a day, and only a small number therefore are issued. It is not always easy for an occasional user to make sense of these papers—which are strictly intended for internal use.

The Bill having been agreed by both Houses it has *Royal Assent* and is known henceforth as an *Act.* Acts may either come into force immediately; at a date specified in their text, or 'at a date which the Minister may by order shall appoint'.

Commencement Orders (or Appointed day orders)

These are Orders which bring into force part of the whole of an Act. There is generally no compulsion on a Minister to introduce them within a particular time—e.g. the Easter Act (fixing one date every year for Easter) is on the statute book but has never been brought into force. It was passed in 1928. Like other Statutory Instruments they are listed, separately, on the *Daily List* and almost always appear also on HMSO's Prestel frames. There may be more than one order to each Act. The Town and Country Planning Act 1971 has had (to date) 75 such Orders.

Statutory Instruments

A Statutory Instrument is an order issued by or on behalf of a Minister, under the authority of an act of parliament. They are commonly employed to adjust matters of detail, but may, of course go considerably further than that. For instance, on the one hand the whole field of legislation relating to road markings, traffic signs, etc, is controlled by an SI—the Traffic Signs Order (Price £7.70) and so is on the other hand the hours of labour of bakery and sausage factory workers at Christmas time (The Baking and Sausage Making (Christmas and New Year) Regulations (SI 1980/1576) Price 15p).

These documents therefore cover a wide field of subordinate legislation, some very important, some of little moment. There are generally over 2000 of them a year, and the confusing thing about them is that they are not all subject to the same parliamentary procedure. All SI's, other than local ones—which are difficult to track down—appear in the *Daily List*: important ones in HMSO's Prestel database. Not all SI's have to be laid before the House. Those that do not (about half) come into force quite simply on the day mentioned on them.

Those that do have to be laid comprise generally but not exclusively the more important ones and are subject to a multiplicity of procedures, but of these there are two principal ones:

(a) *the affirmative procedure,* whereby the order—or a draft of it—is laid before the House and must be approved on a motion in both Houses (the H of C only, for Orders relating to finance).

(b) *the negative procedure,* whereby the order comes into effect as directed by the Minister but will be annulled if a motion seeking such a course is passed in either House within forty sitting days of its being laid.

Both Houses publish lists of SI's in progress which are subject to parliamentary procedure but these are not widely available. Since SI procedure is so variable, the easiest way I can advise you to keep in touch with parliamentary developments is to phone the P.I.O. In our experience relatively few enquirers need to keep in touch regularly with the progress of SI's, but a large number do occasionally. Debates on SI's take place either on the floor of the House or in *SI Standing Committee.* In either case the fact that a debate is to take place is noted in the *WIB.*

Northern Ireland Legislation

Between 1922 and 1974, Northern Ireland legislated on most domestic matters for itself. After the suspension of Stormont and the substitution of direct rule, surrogate arrangements obviously had to be devised. What now happens is that major NI legislation is carried forth as UK Statutory Instruments, but with rather different procedures, and consequently rather different finding methods.

The system now is that a stage called the 'proposal stage' has been instituted. A 'proposal for an Order' and an explanatory document are published. The proposal stage appears to be somewhere between a Green Paper and a White Paper, but it is accepted, I think, that comments may be made and received thereafter. Then a firm draft order is laid before both Houses and has to be approved on a motion. These are then numbered up in the UK SI sequence. However, let us suppose that the Cats (NI) Order is SI 1981/2217. When the 1981 Statutory Instruments volumes are published, there will be a gap at 2217. That is because—for some reason—all these Orders are printed in the volumns called *Northern Ireland Statutes*

There is only one finding method known to us, and that is the one which is published in the WIB. This is an alphabetical list of N.I. orders in progress, giving the dates of receipt of the various documents, and of the dates of their debate.

Scrutiny

The main purpose of scrutiny is as its name implies, to put government policy actions to the test. The main forms are questions, debates and Select Committee Investigations.

There are over 40,000 parliamentary questions every year. They range from the local and personal (will the Minister give an undertaking to reply forthwith to Mr. G. Bloggs' letter concerning his pension) to the very wide (is the Minister satisfied with current policy on immigration and will he make a statement). Keeping track of them until recently was a great headache to everyone concerned. We used to wilt when the voice at the other end of the telephone said (as it did eight or nine times a day) 'There was a PQ sometime last summer on office development policy . . . can I have the reference'. For *debates*, we have had since 1955 a very effective if labour intensive, visible index arranged by subject but not for PQs.

The new key to PQs is our computer indexing system POLIS; and since it is very much the latest example of how to keep in touch with very recent developments, I shall expand on it at this point.

POLIS

POLIS is an online computer indexing system. It is composed of a databank held on a Univac computer operated by Scicon Ltd at Milton Keynes, with retrieval via the UNIDAS (Univac documents accession service) system and intelligent terminals in each of the principal locations in the House of Commons Library. There are ten terminals at present, but as the system builds up, this figure will reach 24; and outside users on a dial-up basis will also be accommodated in the near future.*

The information is fed in by a newly set up computer indexing section. The indexers use (and continually maintain and update) a controlled indexing vocabulary or thesaurus specially developed for the system for the main subject entries. POLIS enables reference by subjects online, to PQs at the moment and as it grows, it will also include all debates, all parliamentary papers, many SI's, stages of legislation, EEC documents and debates thereon, some foreign official publications, government press notices, etc.—all available, it is hoped within 36 hours of the debate having taken place or the document having been received. It will supplant the VIs we have at present for these matters over the next 4–5 years. But it has already proved its worth with PQs. The P.I.O. is, of course, able to access PQs on POLIS on an enquirer's behalf.

Select Committee

These have grown both in number and in importance over the last couple of years. The system is now that each department's work is 'shadowed' by an all party committee of 11 or 12 MP's with supporting staff, and any aspect of that department's work or functions can be examined in depth. Notice of the composition of Committees and meetings for the forthcoming week are given in WIB: the public meetings are often also in Saturday's or Monday's papers. The Committees usually meet in public to examine witnesses and in private to deliberate. Evidence taken is published as HCP in daily parts, often 3–6 weeks in arrears. When a report is agreed on, it will be published as a HCP and will include—usually—the consolidated evidence and the more important memoranda presented. The government then publishes a *reply* to the Committee itemising its reactions and intended action.

Notice that a particular report or piece of evidence has been published is given in each week's *WIB*. A telephone call to the P.I.O. can usually elicit if publication of a report is imminent. A resume of all the current enquiries and past reports of the Committees for the session is available on Prestel, via frame 5000, a section which is usually updated fortnightly.

To discuss the tools of the trade involves frankly admitting those available outside Parliament are not as good as they might be. Published indexes to Parliamentary Papers or to Parlimentary debates are at least three months in arrears, and sometimes longer. Some libraries I know—not ours—cut up the *Daily List* and paste it up into ledgers so as to be able to deal with enquiries for recent Government publications. That is a practice which should not be necessary in the days of the microchip; and HMSO are exploring ways of electronic publishing of their catalogue. Likewise, now that *Hansard* is computer typeset, a basis exists for developments in global searching in that huge database. With POLIS going public, we hope, soon, the future at least potentially holds out much in the establishment of self-help tools for parliamentary information.

Whether the economics of such operations would prove practical for the public reference library, or the company information office, remains to be seen. The printed word and the telephone are likely, I suspect, to remain the general weapons of the average information broker for a little while yet. So I recommend the following printed word or Prestel approaches, which will probably not be unfamiliar to any of you:

(a) for legislation both Public and Private Bills, and N.I. Legislation; for the programme for the week and composition and current work of Committees and White and Green Papers, the *Weekly Information Bulletin.*
(b) for the past work of Select Committee, Prestel Parliament.
(c) for the publication of (on the day) all Government publications and of S.I.'s, Prestel HMSO
(d) for the publication or 'publication' of Departmental non-S.O. papers, the Chadwyck Healey microfiche set.

For any parliamentary matter not covered by these heads, telephone the P.I.O. That is not in the nature of an advertisement but simply—in most cases—the most efficient way of going about things. If parliamentary matters loom large in your workload, though, I strongly advise you to take an interest in POLIS as it develops—it will become, I think, a tool of very great efficiency and immediacy.

The Public Information Office

The functions of the Public Information office (set up in 1978) are basically fourfold (1) to reply to telephoned and written enquiries of all kinds about the work, the history, etc. of the House. (2) to publish a weekly and annual digest of the business of the House, its Committees, etc. (3) to publish a series of papers/monographs on the House. (4) to provide an Education Service, principally to organise visits, jackdaw type packs, and audio-visual presentations for schoolchildren.

Undoubtedly the most important function is at present and always will be the first. We are both providers of information to those who do not know where to get it—you'd be surprised at the number of people who telephone to find out who their M.P. is, or what party Mr. X. or Mr. Y belongs to—and also, perhaps for the more expert, interpreters of facts which others have found or half-found and providers of information too current to appear in published sources. Our 50,000 annual enquiries are very varied. They range from the very technical (what requirements are there under the Statutory Instruments Special Procedure Act 1945, S.3 for special reports on the Falmouth Harbour Revision Order?) to the very simple (Who's the Liberal spokesman on agriculture?).

Most enquiries are very legitimate. The citizen, in these days of voluminous legislation, uncertain politics and elaborate administration, can find that he is lost. I am not trying to say that its our function to run a legal advice service—for that sort of thing we refer the enquirer to a lawyer or CAB. However the House of Commons in the past has rightly come in for some criticism for its treatment of the public enquiry. If we can rectify that via telephone enquiries I think we will have made great progress in making information available.

The other arms of the P.I.O.s work are threefold. I've said we aim to be an intermediary for telephone enquiries, or a post of last resort. We do however, *promulgate* information, in three forms:

(a) the *Weekly Information Bulletin*
(b) Factsheets
(c) Prestel

I will go into each of these in a little more detail.

The *Bulletin* is a respository of a very great deal of information which previous to its establishment was obtainable only through the Vote Bundle, or not available at all. It includes each week a list of the business on the floor of the House for the past and forthcoming weeks; and then a long section on legislation—a complete list of Public Bills, and the stages they have gone through in both Houses and their Chapter Number (together occasionally with subject indexes to those Bills); of Private Bills and their Commons stages.

Then follows a section on Bills which have been processed during the week—together with publication details for newly-issued ones. The legislation section is concluded with the table of Northern Ireland legislation I mentioned before.

A section on Committees follows. This includes the progress made by Standing (i.e.) Bill Committees and the clause numbers of each Bill discussed, and the announcement of new Committees and the names of M.P.s who are to serve on them. In respect of Select Committees a list of evidence, reports, and Government Observations published follows a note of their meetings in the past and coming weeks.

There then follows a list of European Community documents received by us during the week—this is (I believe) often the speediest printed notification of the appearance of these documents.

After a section on the White and Green Papers we have received during the week (and where to obtain them if they are not HMSO documents), a list of party strengths in the House of Commons follows.

On *Prestel* we have at present a more limited database. Our participation is limited because as yet Prestel does not repay us fully for the time, effort and money we commit to it. I cannot yet say 'I must have 50 more Prestel frames', or 'half a typist more to input data faster', because the use made of the system does not, yet, justify it. There are still only 10,000 Prestel users. However, our database (joint with the House of Lords) does include some useful material: coming business; and a complete dossier of the composition and recent/current enquiries of all public Select Committees, and a list of Members by constituency. For Prestel services, we participate in both the C.O.I. and LASER umbrellas.

Last in this extended commercial is our series of *Factsheets*. These are obtainable free on request, and there is a mailing list as well. They are about a number of aspects of the House's work we find are often required; there is one on Government Bill procedure, for example (which I dealt with today) and one on Private Members' Bills (with which I did not). These, I think, have been the means to self help for many enquirers.

Conclusions

So, what of current affairs information—resources and needs—about Parliamentary matters. How should we sum up? I think it is fair to say that the resources are full, but disparate, and not particularly easy to get direct access to. I regard the role of the P.I.O. very much as an intermediary in the *present* situation, and I hope we can help you to get the information you need if you find difficulty in finding your way about the rather fragmentary sources I have pointed out. What of needs? One of our problems is that we have only a sketchy idea of what is wanted. In the *Bulletin*, we have asked from time to time for comments and suggestions. But there seems to be no clear general view as to what *is* required, and until there is, little exists to gainsay a very great weight of Parliamentary tradition, which is encapsulated in the view—not necessarily, I may say, held by the House of Commons Library or the P.I.O.—'We've always done it this way—it serves *us* well—why change?'. So I will listen to *your* views with great interest.

*Since delivery of this paper the number of terminals has increased to 17 and the first outside users have subscribed.

A practical introduction to sources of information about the European Communities

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Paper presented at the Aslib conference 'Current affairs information—resources and needs', London, 4 June 1981

Introduction

IT IS A PLEASURE to explain what the sources of information are about the European Communities, both in publications and computerised documentation system, and how this information is disseminated in the UK and where you can find it. With the development of the Community there is a much-felt need for rapid information and awareness of the work of the Community and its institutions. It is important to know how the institutions work, and who does what in the Community in order to understand the information network.

The Community has five institutions:

1. *The Commission* consists of 14 members appointed for four years by agreement between the governments of the Member States. Each member is responsible for one or more specific areas of Community policy. The Commission's role under the treaties is: *the right of initiative* and exponent of Community interests in the Council; it is *the guardian of the treaties*, and is *the executive arm of the Community*.

2. *The Council* is the ministerial organ of the Community. It is composed of representatives of the governments of the Member States. The Council of Ministers is the main decision-making body within the Communities, taking the final decision on almost all major Community problems.

3. *The European Parliament* has 434 members (the UK has 81) elected by direct universal suffrage throughout the Community. The Parliament's main task is to monitor the work of the Commission and the Council. It has to be consulted on most Commission proposals before the Council can take a decision on them. At present there are fifteen committees covering between them all the Community sectors of activity, and its members can put written and oral questions to both the Commission and the Council. The Parliament has the power not only to reallocate expenditure of the Community budget, but also to increase its volume, or to reject the budget as a whole.

4. *The Court of Justice* ensures that in the interpretation and application of the treaties, the law is observed. It is a supreme court of eleven independent judges, assisted by five advocates-general, all appointed by the Member States. The Court is the final arbiter on all legal questions under the Community treaties. The Court of Justice deals

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with disputes between Member States, institutions, firms or individuals and their ruling is binding.

5. *The Court of Auditors* is the body in charge of external auditing for the Community budget. It consists of ten members, appointed by the Council of Ministers acting unanimously after consulting the European Parliament.

The Economic and Social Committee

The E.S.C. is not an institution; it is purely a consultative body and has a similar consultative function to that of the European Parliament in terms of consideration and expression of opinions on Commission proposals and can also submit opinions on its own initiative. The E.S.C. consists of representatives of various sectors of economic and social life (156 members).

This Committee provides a forum for social-economic consultation in the Community activities, which are bound to effect economic interest groups in many ways.

The European Investment Bank

This body created under the EEC treaties is the European Community's bank for long-term finance.

The EIB's principal task is to channel finance on a non-profit making basis into investment promoting the Community development, in other words, to help draw together the states and peoples of Europe in economic and social progress.

Commission proposals

These institutions work mainly on Commission proposals. How the Commission reaches its decisions and draws up proposals for submission to the Council is more or less as follows:

In drawing up proposals and, in particular, when laying down policy guidelines, the Commission departments enter into very wide ranging consultations, seeking the opinions of trade associations, top civil servants and trade union organisations. Once the main lines of its policy have been agreed, these departments cooperate with national experts to work out the practicalities of arrangements to be adopted or proposals to be submitted. These experts guide the Commission in the search for suitable technical formulae which will be generally acceptable to the ten governments. In due course the results of these preparatory proceedings are adopted by the Commission and sent to the Council.

The Commission draft instruments, or proposals, (about 900 a year) are known as *COM*. They are available to the public on request at the Commission information offices. Proposals on which the European Parliament must deliver an opinion are regularly published in the *Official Journal*. Citizens and organisations therefore have an opportunity to acquaint themselves with them and to put forward their own points of view, either through their representatives in the European Parliament and in the Economic and Social Committee, or through professional and trade organisations, or by approaching the Commission directly.

Information concerning the work of the European Communities institutions comes in a number of ways. I will concentrate only on certain publications and on-line systems. The Commission with her proposals for legislation, studies, reports and statistics, etc. is the major information provider among the institutions of the European Communities.

Publications

The Community institutions have an office for official publications. This office is the inter-institutional body responsible for publishing all official publications of the institutions.

Each separate institution produce a mass of papers and this documentation tends to have a status, which varies according to which body has issued it, and at which stage. To describe all this great amount of literature in every field and policy is impossible because of the very vast subject. I will concentrate on the more important publications and those with a general source of information. Certain publications contain the role of the Community, others its policy, studies or statistics. Those containing the role can be divided in the terms of primary and secondary legislation; the founding treaties are the primary legislation of the Communities, and secondary legislation consists of the subsequent laws made by the organs of the Communities.

The primary legislation consists of the treaties of the ECSC, EEC, EURATOM, Treaty of Accession of the UK to the Communities, etc. *Secondary legislation* is the legislation made by the Community and consists of *regulations, directives, decisions, recommendations* and *opinions*. All draft and final legislation and official notices are published in the Official Journal of the European Communities.

The *Official Journal* is the official gazette of the Community institutions and is an important vehicle for legal information and public notice. This gazette is divided in three parts:

1. (L) *Legislation* consists of community acts, regulations and decisions (the law of the Community).
2. (C) *Information and Notices* contain the current activities of the Community institutions. The Commission proposals for legislation, the opinions of the European Parliament the value of the ECU are published in this journal.
3. (S) *Supplement*, with notices and public contracts. Both public work and public supplies.

All three parts are published daily.

To keep in touch with the development of the Community the general publications described below are very useful:

The Bulletin of the European Communities records the monthly activities of the Community and its institutions. It is compiled from background material and monthly contribution provided by Departments of the Commission. It is also a valuable guide to documentation, with useful reference to the Official Journal, catalogue of publications and other sources.

The Supplement to the Bulletin. These supplements are published separately and consist of basic policy documents including some of the more significant proposals, normally not published in the Official Journal.

The General Report on the Activities of the European Communities is a comprehensive document which gives the main development in the Community activities.

The Programme of the Commission contains useful information and gives a clear indication of the work to be carried out by the Commission during the coming year.

The Directory of the Commission. The Commission produces twice a year a directory of its members and staff. It is a useful document because it contains details of addresses, telephone numbers and responsibilities of individuals. A similar directory. is produced by the European Parliament for its members, and includes useful information on the composition of the Council of Ministers.

European File appears every month and deals with different topics of Community policy.

The Documentation Bulletins published by the Central Library and archives of the Commission, consist of information series bulletins, listing acts and documents of the institutions, articles, periodicals and bibliographical reference on special subjects. These are excellent sources for tracing the legislation through the many and varied stages of the consultation procedure

Statistics. The European Communities have their own statistical office. The principal task of this office is to provide all the Community institutions, but primarily the Commission, with the statistics required for formulating and monitoring Community policies. This office has developed considerably in the past years in providing a very wide statistical data to the public, both in the form of publications and on-line access.

Some of the general publications are:

Eurostatistics which provide a monthly data for short-term economic analysis.

Basic Statistics is published annually giving a selection of Community basic statistics and comparison with a number of other European countries, plus the USA, Japan and the USSR.

Eurostat Review complement the existing publications of Eurostat by presenting annually in a single volume the main statistics showing how the European Community has developed over the last ten years.

Eurostat News, the monthly bulletin of the Statistical Office, gives a considerable amount of information about the activities of this office and its statistical publications.

The most important development of Eurostat is the opening to public access of their internal databank and databases.

Online access

CRONOS-EUROSTAT, the European Community's statistical data bank, set up by the Commission for processing and consultation of time series, has been since January 1981 open to public online access; this follows an agreement between the Commission of the European Communities and Euronet-Diane and the host information service, CISI (Compagnie Internationale de Service en Informatique, Paris).

This link up makes Community statistics accessible to a very wide public via easy consultation procedures.

CRONOS is the name given to a collection of data bases produced by the Statistical Office of the European Communities (EUROSTAT). The series it contains are fed into and managed centrally by the statisticians at EUROSTAT. CRONOS's aim is to facilitate and improve the observation and the analysis of the socio-economic trends in the Community. The material contained in these databases is therefore very varied, comprising such topics as general economic information, national accounts, external trade, energy statistics, agriculture, etc. They relate to the member states of the Community and in certain cases outside countries such as the USA or Japan, or the third world. The European statistics contained in CRONOS is the result of 20 years of information gathering and processing by EUROSTAT which consists, in particular, in elaborating data relating to the Community, its member states being considered one entity and not individual countries. An important feature is that, the data being harmonised, it is possible, using the CRONOS-EUROSTAT statistics, to compare the European countries amongst themselves, and to place them in context of Europe taken as a whole. A possibly more important feature is that users can directly perform their own mathematical and statistical equations on the data in order to obtain forecasts and trends.

Other sources of information

The Council of Ministers publishes *press releases* giving useful information on what has taken place at the meetings of the Council. It also publishes an *annual report* called 'Review of the Council's Work', and a *programme of work* outlining the intention of the presidences during the six months of office. All the decisions and regulations of the Council are published in the Official Journal of the European Communities.

The European Parliament's working documents, bulletins, digests and directory are available from the European Parliament Office in London. The debates of the European Parliament are published in the annexes of the Official Journal.

The Court of Justice's opinions and texts of judgements are published in a publication entitled 'Reports of Cases before the Court'. This information is also given in the series 'C' of the Official Journal. The Court publishes also a weekly information bulletin which is available on request from the Press Office of the Court in Luxembourg.

The Court of Auditors draws up an annual report after the closing of each financial year; this report is published in the Official together with any comments made by the institutions.

The Economic and Social Committee issues a monthly bulletin on the activities of this committtee. This contains the text of opinions, together with a list of future events of this body. Two useful publications of this Committee are the Annual Report on the Activities and the Directory, similar to the one published by the Commission.

Most of these official publications are on sale and available from the Government bookshop, H.M.S.O. Reference can be found in the monthly catalogue of publications, which is published in the Bulletin of the European Communities. HMSO Agency Section publishes a daily list of Community publications received. They have a similar list of publications available in *the Prestel system.*

The expanding volume of data available in Europe has required online systems to be introduced in order to facilitate access and to make better use of it. I will concentrate only on Euronet Diane, the European public telecommunication network and certain Community databases.

Euronet-Diane

Some years ago, the pressing demand for specialised information brought about in Europe the creation of numerous information services making considerable use of advanced technology and particularly of computers; these services were independent as they had been set up to answer isolated and specific needs and they showed a tendency to create a multiple of small networks in order to disseminate information.

It was only in 1971 that the notion of a Community policy was formulated in a resolution recommending co-ordination of activities in the field of scientific and technical information in the member states. The first plan of action was then approved in 1975, one of the main objectives of this plan being to create a transmission network to make such information available 'to all who need to use it'—research workers, managers, engineers, decision makers throughout the Community 'by the most modern methods' and under the most favourable conditions as regards speed and expense.

A special transmission network, Europe's first high-speed computerised information retrieval system (Euronet-Diane), now links together the capitals of the member states of the Community. Diane (Direct Information Access Network for Europe) is composed of independent European computerised information services (known as 'Hosts') which can give access to databases and databanks.

Access to this expanding European network of information—which range from scientific and technical to legal, economic and social data—is remarkably simple. All the user needs is his own computer keyboard and screen, a normal telephone and a pass-word to enter the system. If a user in London, for example, wants to know the latest state of research on a particular subject in Italy, he simply picks up the telephone. His terminal transmits the request to a switching exchange which relays him to one of the host computer in the network, and the information will come back either with an answer or with a reference to where the information can be obtained. The network has been specially designed to allow access by different makes of computers and all are covered by common 'command language'. This means that users in all the Community member states can talk to each of host computers in a single language.

The Commission is currently looking into the possibility of developing computer translation of the data itself. Use of this method—known as 'Systran'—would greatly increase the value of Euronet information. It would mean that a user in Italy, for example, would be able to apply in Italian for information from a British data base; the request would appear at the data base in English and the relevant information arrive back at the user in Italian.

The Commission is also studying the possibility of linking Euronet to the new videotex technology (a system which presents computerised data in visual form by means of a television set) thus enabling a subscriber to telephone for information which is then displayed on his television screen. One year after the official inauguration, approximately 28 hosts are connected to Euronet Diane and more than 1700 organisations currently use the network's 250 databases. *Euronet news* and *Euronet directory* contain useful information on hosts and data bases connected to the network. They are available from Euronet Launch Team in Luxembourg.

Two databases available on Euronet Diane deserve a special attention because they concern everyone in Europe, CRONOS, the statistical database which I have already mentioned, and CELEX.

CELEX

The problem of information retrieval is particularly acute in regard to the Community law. Lawyers, government departments, industry or academics, all need a rapid, comprehensive and up-to-date access for this new body of law.

CELEX (Communitatis Europaeae Lex), the inter-institutional computerized documentation system for Community law, was set up by the Commission of the European Communities to automatize retrieval of documents relating to Community law and to meet the needs of a rapidly developing organisation with a wide range of activities. All the Community institutions share in and are responsible for its operation.

The system, which is open to the institutions and some government departments, is being gradually made available to outside users through Euronet, the European network. The official opening to outside users is scheduled for 1982. Public or private sectors will then have the same access to Community law databases as officials of the EC.

The scope of CELEX documentation system covers Community law and connected documents, that is, the basic treaties, instruments adopted by the Community executive bodies, decisions of the Court of Justice, national measures to implement Community law in the member states, and questions submitted by members of the European Parliament. The system is designed to be accessible in all Community languages.

CELEX files contain data going back to 1952 and up-dating is done weekly, with a delay of three to four weeks from the date of publication in the Official Journal. The number of documents currently stored and directly accessible by console exceeds 40,000. CELEX will offer access to an up-to-date, complete information retrieval system using advanced technology and covering an expanding sector which concerns all the citizens of the European Community. The legislation file is the basis for the annual publication of a *Register of Current Community Legal Instruments*, for which an up-dating can be obtained by interrogating the CELEX system.

In publishing the register, the Community institutions are responding to a frequently expressed need by providing the general public and the legal profession more particularly, with a documentary tool which is easy to use. The first edition of the register gives references for Community legislation in force as at 1 July 1979, and contains agreements and conventions concluded by the Communities in connection with their external relations; binding instruments and secondary legislation and decisions of the representatives of member states governments meeting within the Council.

CIRCE

The Commission also has an internal service called CIRCE which is in charge of running the internal databases. Certain files may be open, like CELEX, in the near future for access to outside users. CIRCE (European Communities information and documentary research centre) was established in 1976 to solve the problems connected with the gathering, processing and distribution of information inside the Commission. This was also due to the rapid development of the Community institutions, the expanding volume of data available and the need to have a quick access to them.

After four years of function, CIRCE has solved the various problems of the internal documentation retrieval, and has established useful databases.

Dissemination of information in the UK

In the UK, information on events and work of the Community institutions is available either from the Commission information offices, or Government departments, university libraries, and also from Commercial Agency and specialized journals.

For the various databases available online through the European network, see the Euronet Diane directory. The Commission also disseminates information through the information offices or European Documentation Centres (EDCs) and Depository Library (DL). The Commission has a main information office in London and regional offices in Scotland (Edinburgh), Wales (Cardiff) and in Northern Ireland (Belfast). The essential responsibilities of the Commission information office in the member states are to inform as wide a public as possible in the regions they cover of the aims and nature of the European Community, its institutions and policies.

The information office of the Commission can provide general and specialised information about the work of the European Community. The structure of the London office is divided as follows:

1. *There are 6 information officers*, including the head and deputy head of the office. Each is responsible for certain sectors of activities, such as the press, employer's organisations, trade unions, consumers group, trade associations, women's organisations and schools and universities. In addition, each is a specialist in one or more aspects of Community policy and responsible for contacts with particular milieux.
2. *There is an information unit*, which is responsible for documentation, publications, research, and answers general questions in all subjects.

   This unit consists of the library and the data room.

   In the library you will find a good selection of reference books and other work on European economics, history, political science, etc., as well as a complete collection of Community Official Journals, statistics, studies and official publications.

   The data room contains virtually all official documents. There are about 1,500 files reflecting the Community policies. These files cover all the areas of work dealt with by the Community and gives as up-to-date a picture as possible of the current state of play of the Commission proposals as they go through the various stages. A large collection of microfiches of the internal documentation system and also all speeches made by the members of the Commission or important politicians are kept in the data room. The data room is also responsible for running the Commission data bases of the internal documentation system—CIRCE. All the material in the data room and library is available for reference and can be consulted in the library reading room.

The information unit can usually deal with general and technical queries about the work of the Community institutions and operates a questions and answers service from 10.00 a.m. to 5.00 p.m.

The London office of the European Commission publishes a monthly magazine, *Europe 81*. The basic aim of *Europe 81* will be to spread information about the Community decisions and policies, and to show their impact on the lives of the British people and on those of other member countries. *Europe 81* incorporates *Euroforum*, providing news and an account of the Community activities from the Commission in Brussels. This magazine is sent out to readers by the London office of the European Commission. Some other useful publications are produced by this office like background reports, press releases, facts and figures, etc., all available on request. Similar information and facilities to those provided by the London office are provided by the regional offices of the Commission.

The European Parliament is also represented in London. An information office exists which can provide either the MEPs or political organisations and individuals with most information concerning the work of this institution, including the progress of draft legislation, as well as some work of national parliaments.

Since 1973, the Commission has sent a complete range of its publications and official documents to a number of universities and public libraries. The transmission of Community official documents and publications to EDCs is undertaken to assist and promote the establishment and running of departments of European studies in university and higher education. The aim was to promote these departments with back-up information and documentation for the purpose of study and research into European integration. At present there are 45 EDCs in the UK.

The DLs (Depository Libraries), six at present, make the Community publications available to the public. It is generally a question of material libraries which are equipped to ensure and disseminate information to other large libraries in the country. A complete list of EDCs and DLs can be obtained from the information unit of the Commission information office in London.

The Government departments can be particularly useful for information on draft legislation which is still under discussion and copies of which are not available from the Commission information office, because they are not yet official. Very often an official from the relevant ministry is involved in discussions and can therefore give some idea of the scope of the proposal and the likely timetable for making the text widely available. The relevant department can also be very helpful in explaining how the UK Government intends to implement EEC legislation and the effect this will have on British law.

The Civil Service Yearbook, which appears annually, gives a breakdown of subject responsibility by departments or ministries, with the appropriate telephone number.

The Department of Industry has an EEC information unit. This unit was set up with the aim to give businessmen and firms a wide range of general EEC information and sign-posting services to more specialised sources of advice. This unit can usually save businessmen time and trouble by finding the right contact in another department or organisation. They publish a section on EEC topics in the weekly magazine called '*British Business*'. This journal is an excellent source of information on EC news and new legislation as it affects trade and industry in the UK. Occasionally they produce a useful check list of all EEC legislation, passed and still under discussion, in particular subject areas, and a useful list of EEC sources. They also list the more important legislation published in the Official Journal each week.

The Parliamentary online information system. POLIS is a system of computer-based indexing of parliamentary information, developed by the library of the House of Commons for the use of their members. The system is now available online through teletype compatible terminals over the public telephone network by arrangement with 'Scicon'. The system contains different categories of material, one of which will show progress of discussion in Westminster and in Europe on European legislation. Other material will include a range of European Community official publications.

There are many organisations and commercial sources to alert researchers, businessmen and individuals to events regarding the Community. I will mention to you only some, but a visit to the library of the Commission information office can give you an idea of the vast range of information available from bodies outside the Community institutions.

European information services, monthly bulletin issued by the British section on the International Union of Local Authorities, and the Council of European Municipalities, to inform and to help improve local authorities' knowledge of the European Community and to alert them to measures taken by the institutions likely to have an impact on local administration and also to develop their influence on policy making in these fields.

Euroinformation Limited is an independent agency specializing in European Community information. This agency can provide up-to-date information on any aspects of the EEC policy and also useful guidance on funds available to the UK from the European Communities. In addition they publish a fortnightly bulletin on events and a detailed account of the work done, in the period of reporting, by the European institutions. This bulletin—Eurobrief—is also a good guide for tracing recent Commission proposals and publications.

Europe. This daily bulletin produced by the 'Agence international d'information pour la presse' in Brussels, contains a current account of various activities of the Community and its institutions. This bulletin is very popular, even among the officials of the Community.

Community Markets. This is a monthly survey of the activities of the EEC published by the Financial Times.

European Digest. Useful summary of the activities of the Community institutions. Compiled by the GLC Research Library, this contains concise descriptions under broad subjects, with extensive bibliographical references.

And finally, in my view, the best way to know what is going on in Europe, and to understand the Community mechanisms, is to read regularly some of the specialised publications available, to keep in touch with one of the Commission offices, and why not visit one or all of the other nine countries of the European Community for your summer holidays!

The international political scene

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Paper presented at the Aslib Conference 'Current affairs information—resources and needs', London 4 June 1981

Introduction

'THE INTERNATIONAL POLITICAL Scene' is a very general and somewhat vague heading, so let me start by explaining what it means in the context of my paper. Naturally, my perspective is the business viewpoint. I shall be looking at the *international political environment* in relation to *business policy on public issues*; and will discuss the more important sources of information on political developments and some of the problems of using this type of information. I say 'discuss' because I will be providing a commentary based on practice and experience, rather than a critical review. Also, I thought it prudent—in the interest of good relations—not to mention any proprietary services by name.

What do we mean by the political environment? The conditions under which business operates are determined partly by the laws of supply and demand, and partly by a host of other factors which have a political basis. At any one time, the business environment will reflect the relative influence of the various interest groups in society who have a claim on business and the way it is run. At the front of the queue *always* is Government—in its various forms; other claimants are trade unions, consumerists, environmentalists, and so on. The queue is a very long one. As you move into the international environment, the pressures increase both in scope and intensity. At the international level party politics are less important; but ideology plays a strong part in motivating the various interest groups.

All businesses, in some way are affected by international politics. Companies which export or have foreign investments will have a direct interest in the politics of their overseas markets. Companies which rely heavily on imports will be concerned about political changes affecting the reliability and price of supplies. Other companies will be concerned about what they see as unfair competition from foreign imports. And—in case anyone feels left out—all of us as members of Great Britain Limited, are affected by the country's position in the world economy, both in terms of its economic relationships with other countries and its political standing.

Each company will have a different view of international politics according to the size and nature of its business, its geographic spread and how its senior executives interpret the company's interests. Each will decide what resources, if any, should be devoted to political staff and formal systems of information collection and analysis; and to what extent the company should rely on the services of third parties such as trade associations or consultants.

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For this reason, there would be little point in trying to give a critical review of information sources and services or to recommend particular products. Rather, I shall offer some observations based on experience in my particular field—Public Affairs—in the context of my own company—Unilever. Unilever, as you may know, is a large Anglo-Dutch company which has manufacturing and marketing operations in 75 countries and exports to over 100. Our products are mainly consumer goods: foods, detergents and toiletries. There is no other company quite like Unilever; however, our interest in international political affairs is extremely wide, so I hope my paper will contain something of interest for everyone.

The International Political Environment

Before discussing information sources, I want briefly to sketch the international political scene, pin-pointing the main players and indicating their potential influence on business.

There are many ways of classifying political activity. I have chosen the following:

National Political Environments
  — Home and Host Countries
Regional Political Environments
  — European Community and others
Political groupings/blocs
  — OECD, OPEC, etc.
International political forum
  — United Nations
Pressure/interest groups
  — Consumerists, Trade Unions, etc.

1 *Home country* —i.e. the U.K.

Apart from the general economic framework which is set by the Government of the day, there are specific policy issues which directly affect the prospects for international business, for exporting and investing overseas. These include the Government's policy towards particular countries, including aid to less developed countries; measures to protect British companies' overseas investments; export promotion schemes and controls on foreign exchange and the transfer of capital. A good example of the effect of shifts in Government policy is the ending of UK foreign exchange controls by the present Government, which has resulted in a massive surge in overseas investment.

2. *Host countries*—where British companies are guests

A company's decision to invest or to continue to invest in a particular country, clearly, will be largely influenced by the country's political stability, the government's attitude to foreign investors and the 'integrity' of government officials in their dealings with business. And having established a presence in the country, the investor may face increasing constraints resulting in loss of control of his business or loss of earnings through restrictions on the repatriation of profits, royalties or service fees.

3. *Regional political environments*

The European Community is the prime example of regional politics. Although there are political and economic groupings in other regions, in Latin America, Asia and Africa, none of them has quite the same impact on British companies as the EEC. Much of the activity of the European Commission is directed at promoting trade between Community countries. However, an increasing number of controversial political initiatives are emerging from the Commission and the European Parliament which seem to have little to do with the aims of the Common Market. A good example is the draft directive on employee consultation in multinational companies.

4. *Political groupings/blocs*

The politics of power blocs may seem remote to many people in business, but it should be borne in mind that the ideological and economic balance between OPEC, OECD countries, the Communist bloc, the Group of 77 developing countries, etc. has a fundamental effect on the world financial and trading system, of which business is part. What better example than OPEC's use of oil as a political weapon: the massive oil price hikes during the 1970s totally transformed the energy economics of business worldwide.

5. *International political forum*

The United Nations and its various bodies and affiliated agencies provide a political forum for nations, regional groupings and power blocs to air their differences and to make recommendations for action on world issues. Business may be affected by the UN's influence on world public opinion or, more directly, by individual governments enacting national legislation based on UN recommendations.

UN bodies and agencies which have most impact on business include the ECOSOC Commission on Transnationals, GATT, the UN Conference on Trade and Development, WHO and FAO, and the International Labour Organisation. Their activities range from hounding companies who operate in South Africa to formulating codes of conduct for the marketing of baby foods.

6. *Pressure/interest groups*

Groups such as consumerists, trade unions, the development movement and the churches play a major part in the political process. They may or may not represent the people they purport to serve. Many are organised internationally, which strengthens their influence. Most regard business as a major target and seek a bigger say in how companies are run and greater accountability to their particular interests.

Business responses to the political environment

Let us consider how business responds to the political environment. This survey should leave no room for doubt that business is part of politics. Few senior executives have to be convinced that political factors influence business either at home or abroad. Where attitudes differ is in the extent to which businessmen accept that political information can be *managed* to serve their company's interests.

If there is a general interest in the political environment, it is encapsulated in the catch phrase of Harold Geneen, the legendary ex-president of ITT. '*I want no surprises*'.

A world without surprises may be the businessman's Utopia but it is an illusion that business can avoid the changes that take place in society.

It is not widely recognised within business that today's rules and regulations, which we all complain about, usually have their origins in public issues. In some cases, business can do little to avoid legislation, but there are occasions where positive voluntary action ahead of enforced change can influence an operating environment and the course of events to business's advantage. This is a perfectly legitimate means by which business can influence the political process.

In overseas markets, companies attempt to evaluate 'political risk', that is the risk that political developments will affect the economics of the business. However, there is growing awareness that companies are not necessarily helpless, unfortunate victims of rapacious governments; that better knowledge about society's expectations, a clearer understanding of how change can affect a company's operations, and a more effective early warning system can help a company avoid, or at least anticipate, threats to its business.

Many managers are sceptical that any sort of order can be produced out of the myriad of social expectations and political undercurrents. However, there is a trend in business towards greater sensitivity to the political environment. We are seeing the emergence of a new corporate function concerned with the systematic monitoring and analysis of political factors in business environments.

However, when we come to consider the function of political monitoring and analysis, a major objective is to minimise the element of surprise in a company's operating environment.

Information sources and services

What do we mean by political information? Really, there are two components: facts and opinions. The two are sometimes difficult to separate. If one is seeking pure fact—uncluttered by opinion—it is always advisable to go direct to source; unless, that is, you would rather not declare your interest, in which case you would be obliged to use a secondary supply.

You will have realised by now that political information is different in character to the other types of information used in business. Not surprisingly, sources and methods of acquisition tend to be unconventional and often veiled in secrecy.

Internal sources

In assessing the political environment, internal sources within a company are very important. Companies with extensive overseas interests usually rely heavily on local managements for regular reports on political developments and prospects in their country; and on regional managements for a broader view. This input is frequently supplemented—and occasionally paralleled—by headquarter's staff concerned with corporate policy and planning.

This applies equally to political developments in the U.K. and in the European Community, for if an issue is of sufficient importance to a company, its management may seek an active voice in the debate, either direct with the legislative bodies concerned or via a trade association. This will give the company first hand knowledge of the political nuances involved.

Although companies usually rely heavily on the views of local management, they tend to treat them with some caution. Increasingly, local managers and even chairmen of foreign subsidiaries are natives of the host country. This provides many advantages, but there is always the likelihood that their perspectives and judgment will be influenced by their interest as nationals. Few indigenous managers want to portray their nation in an unfavourable light, particularly when they are competing with other subsidiaries for capital investment from the parent company. This problem can be overcome by having one or two expatriate managers who have a different perspective of local situations, and also by having political analysts at head quarters who go in for what is called 'second guessing'.

I should add that the problem of over-optimistic forecasting can also arise in the home country.

External sources and services

For the sake of convenience, external sources have been classified into primary, secondary and interpretative. Of course, there is considerable overlap between all three groups.

(i) Primary

I have taken the more important governmental institutions at the national, European and international levels and will say a few well chosen words on how business regards the public information services which they provide.

A general point which applies to all of them. Much political debate resulting in legislation affecting business, starts well before the debate becomes institutionalised; that is before official information services take up the story.

Her Majesty's Government/Parliament/HMSO

Those of us who specialise in international affairs are in exactly the same position as others who look to Her Majesty's Government and its agencies to provide up-to-date and reliable information. In my opinion, Government in recent years has failed to devote adequate resources of management and money to this task, commensurate with the volume of legislation and the burden it places on business.

Use of information technology may provide improvements. The House of Commons is to be applauded for developing its POLIS system. However, as consumers of official publications know well, HMSO is still a bottleneck. I believe HMSO should be actively exploiting computer-based systems, including electronic document delivery. On the other hand, the computer could make things worse. More important than new technology are new attitudes, particularly towards the business consumers of official publications.

European Community

The Community, to its credit, has given high priority to its information services and has taken the initiative in using new technology. Again, closer consultation with business users can only lead to improvements.

United Nations

The UN agencies have an enormous information problem, largely of their own making. Unfortunately, business as a consumer of UN documentation is at the end of the line, and can have little influence on policy in New York and Geneva. However, if there is in the audience anyone from the UN, or perhaps an enterprising information broker, we need a selective alerting service—and are prepared to pay for it.

(ii) Secondary

Bulletin services have sprung up to fill the gaps left by the primary suppliers. We use a number covering political developments and emerging legislation in the UK, EEC and UN. They are useful for factual information but their attempt to interpret politics on behalf of the business consumer can be irritating.

I see a market for computer databases despite the problems of defining and recording political information. Politics is about people, organisations and events: information well suited to computer handling.

(iii) Interpretative

For companies who prefer to rely on others to monitor and interpret the political environment, and for those who want a check on their own internal assessments—there is available a wide range of third party services.

The last few years have seen a growth in the number of consultancies specialising in political analysis. Many of these are offshoots of publishing houses. The services they offer range from broad-brush assessments of regions and countries to the setting up of meetings between business executives and key politicians. The major international banks naturally are concerned with the credit worthiness of countries, and will happily advise potential overseas investors.

Government departments are a major repository of information on the politics of overseas markets. Much of this is public if companies care to ask for it; but British companies seem wary of getting too close to Her Majesty's Government when planning overseas investments. In some other countries, France and Japan for example, this problem does not seem to exist. The business associations, both national and international, are another source of political information. If you have a subscription to one of these organisations, it is worth checking their political intelligence.

The media services—which I define in the broadest sense—I have left till last because they are rather special. To business they are a mixed blessing. We appreciate their immediacy and admire their communicating skills. However, frequently they are an *undesired* source of information. Many people have their own version of the same tale: a corporate planner or manager of a foreign subsidiary is about to make a presentation before top management requesting additional capital for an investment in a particular country; he notices that the chairman of the company has in front of him that day's issue of his favourite newspaper, reporting in lurid detail the current wave of riots or kidnappings in that country. At that moment he realises that his assessment will make no difference whatsoever.

Such tales are obviously apocryphal, and no senior executive will admit that his judgement was swayed by a single newspaper article or television programme. But the moral of the story is reasonable enough: in the absence of a more effective assessment process, senior managers will certainly be influenced by what they read and hear, from day-to-day.

Some problem areas

I am going to finish by looking at a few of the problems of using political information in the business environment.

1. Perhaps the greatest problem is what could be called 'information overkill'. There is without doubt a super-abundance of information, and especially opinion about political developments, national and international.

   The theme of this conference is 'Instant information in a changing scene'. It encapsulates the dilemma of those of us who are concerned with analysing the political environment in relation to a company's public affairs policies: How to put day-to-day events in perspective in determining long-term trends. A natural tendency of business executives is to react defensively to day-to-day events, rather than to view them as part of a shift in society's expectations. A case of 'I can't see the wood for the trees'. Such a reactive attitude very much determines the way political information is used in a company.
2. Another problem, which I hinted at earlier, is the tendency for information providers to *interpret* political facts. It is sometimes difficult to get at the basic facts which one needs in order to make a proper assessment of their significance to one's own company.
3. Finally, we have the question of whether senior executives appreciate the value of systematic political monitoring and analysis. This is particularly relevant to those people who might be considering a career in this field.

   There appears to be a feeling prevalent amongst company executives that politics is too important to be left to the expert; and that such experts may be a threat to the executives own area of competence. These are genuine concerns which need to be considered when making a case for the environmental assessment function. And, certainly, it is no easy task to convince a company chairman of the value of the function when the benefits may not be seen until after the chap has retired!

I do not claim to have the complete answer but suffice to say, if it were not for all those nasty legislators and all those nasty pressure groups, I and people like me might be out of a job!

Chart 1.

A Framework for the International Political Environment

National Environments — Home & Host Countries
Regional Environments — European Community and others
Political Groupings/Blocs — OECD, OPEC etc.
International Political Forum — United Nations
Pressure/Interest Groups — Consumerists, Trade Unions, etc.

Chart 2.

Home Country—Political Issues

Foreign Policy incl. Aid
Investment Protection Schemes
Export Promotion Schemes
Exchange Controls

Chart 3.

Host Country—Political Issues
Political Stability
Foreign Investment Climate
Government 'Integrity'
Constraints on Foreign Investors

Chart 4.

Regional Political Environments
European Communities
Others

Chart 5.

Political Groupings/Blocs
OECD (Industrialised countries)
Group of 77 (Developing countries)
OPEC
COMECON (Communist bloc) etc.

Chart 6.

International Political Forum
United Nations Bodies and Affiliated Agencies
- Law of the Sea Conferences
- Special Committee on Apartheid
- ECOSOC Commission on Transnationals
- UNCTAD
- UNIDO
- GATT
- IMF
- ILO
- WHO
- FAO
- etc., etc.

Chart 7.

Pressure/Interest Groups
National—International
- Consumerists
- Trade Unions
- Development Groups
- Anti-apartheid Movement
- Church Groups

Chart 8.

'I WANT NO SURPRISES'
Harold Geneen, ITT

Chart 9.

Internal Information Sources

Local Management
Regional Management
H.Q. Specialists

Chart 10.

External Information Sources

Primary:	HMG/Parliament/HMSO
	European Community
	United Nations
Secondary:	Bulletin services
	Computer data bases

Chart 11.

External Information Sources

Consultants
Banks
Government Agencies
Trade Associations
International Organisations
Media

Chart 12.

Problem Areas

1. 'Information overkill'
2. Seeking the truth
3. Politics is too important for the expert.

Current affairs information in local Government

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Paper presented at the Aslib conference 'Current affairs information—resources and needs', London, 4 June 1981

Introduction

FIRSTLY, I MUST point out to the reader that this article differs a little from the speech actually given at the conference. My second explanation is the inevitable statement that any views expressed here are entirely my own and do not necessarily represent official Cheshire County Council views.

I propose to discuss this topic under four main headings:

1. The scope of local government, its responsibilities and the pressures that it currently faces.
2. The types of current affairs information that local government needs.
3. How information is coordinated within local authorities
4. How a number of authorities have tackled the problems of coordinating information, with particular emphasis on Cheshire.

What I propose to do is to illustrate the wide range and complexity of the information needs of local government.

Scope of Local Government responsibilities

Local Government covers all aspects of our lives. From cradle to grave you cannot avoid some ramification of it at some time or other.

Education, welfare, social services, recreation, transport, planning, housing, waste collection, law, consumer protection. Authorities have a statutory obligation to provide many of these services. A look at Figure 1 shows how the various services are distributed within the two tiers of local government, Shire Counties and Shire Districts. I can only speak for the relationship between Shire and District Councils and all of my examples will refer to these authorities and not to Metropolitan Counties or Districts.

Shire Counties, as you can see are responsible for the wider issues such as strategic planning, refuse disposal, police; whilst the Districts cover more local issues such as, local planning, public transport operations and refuse collection. There are a number of support services such as administration, law and valuation that are common to both tiers.

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Shire Counties

Strategic Planning
Highways and Transportion and Major Schemes
Countryside and Recreation
Refuse Disposal
Social Services
Libraries
Police
Fire
Education
Trading Standards and Consumer Protection

Shire Districts

Local Planning
Local Highways
Public Transport Operation
Leisure Services
Refuse Collection

Housing
Environmental Health

Support Services

Administration
Finance
Architect
Legal
Valuation

FIG. 1. *Local government functions*

Local Government is big business. Last year it spent over £18 billion and Figure 2 shows how Cheshire's £350 million budget was spent in 1980/81. As you can see the largest proportion goes on education (62 per cent) since we have about 10,000 teachers to pay. Eight per cent goes to social services, nine per cent to pay for policing and seven per cent for highways. Libraries are included in the eleven per cent other services; unfortunately they constitute only 1.8 per cent of the total budget however.

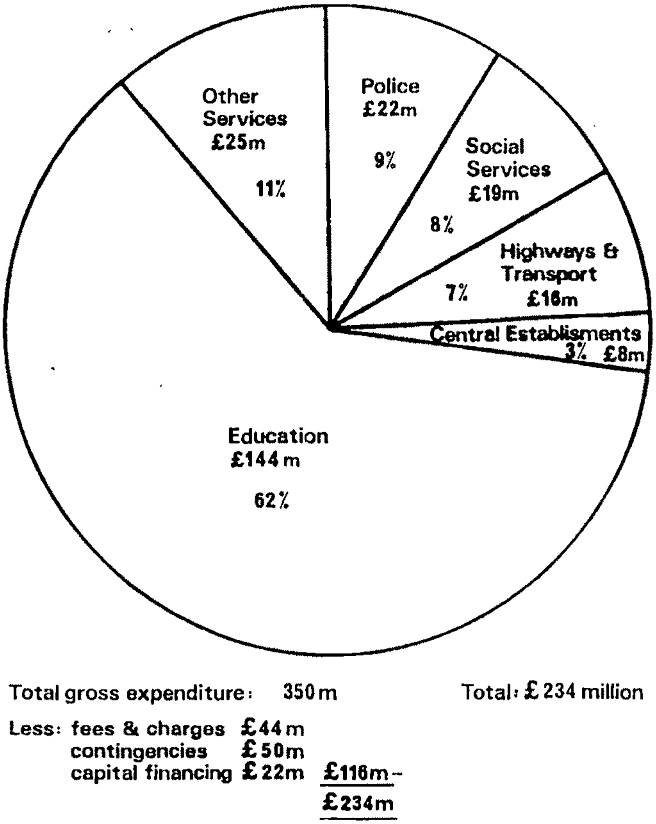

FIG. 2. *Expenditure on major services (1980/81 budget)*

We shall now consider the way in which local government is paid for. Figure 3 illustrates the large central government contribution to Cheshire, some 44 per cent; roughly matched by rate demands on industry and the domestic ratepayer. The balance comes from charges and fees such as planning services and charges for using school premises, and evening classes.

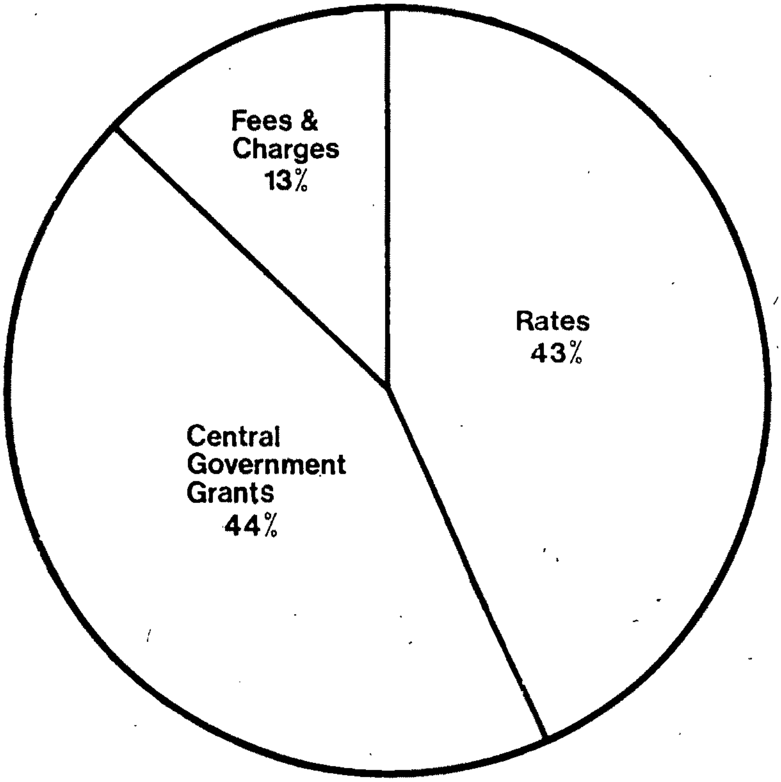

FIG. 3. *Sources of income (1980-81)*

The government contribution comes via the new block grant system that has replaced the old rate support grant this year. This is the grant that Michael Heseltine is threatening to cut for those authorities which exceed his guidelines on expenditure.

Political aspects

In spite of the ideal of local democracy it must be admitted that Central Office and Transport House still figure large in local councillor's minds. Information and advice is regularly sought and given; decisions often seeming to be heavily influenced by central thinking. Certainly this was the case under Cheshire's previous Council which had a Conservative majority of 48 over Labour. Suddenly overnight the recent local elections have changed all that. We now have virtually a hung Council, with six Liberals and one Independent holding the balance. This potential instability has already had an effect; the Labour group had allocated all the various committee chairmanships to its own membership prior to the first full Council meeting. Their defeat on a number of significant chairmanships will reverberate through the corridors of power for some time to come and will affect the way in which information is collected in many ways.

Finally, there is pressure from the electorate for services; demands that the party should fulfill its election mandates.

Professional disciplines

Local Government employs a very wide range of disciplines—planners, teachers, solicitors, engineers, architects and administrators. Cheshire has 41,000 employees of which some 15–20,000 are professionals and of these some 10,000 are teachers.

Types of information needed

Government

There is a wide range of information that local government needs from central government. Circulars, Statutory Instruments, Acts of Parliament; Home Office, Department of the Environment, DHSS etc. all departments issuing instructions of one sort or another. Many circulars, Acts etc. can change the law overnight and have to be acted on immediately.

Reports, memoranda, press notices, block grant announcements and the whole variety of HMSO and latterly non-HMSO publications. Hansard, house building allocations, health and safety legislation, census publications, welfare benefits, Ordnance Survey maps for planners. The list is endless—all these items and much more required from central government.

An incident which happened at County Hall recently illustrates the problems of currency. The new Labour party leader wanted all press cuttings and comment on Michael Heseltine's block grant announcement—before 10 o'clock. Research Library produced the goods before the deadline and an interesting comment on the status of a library service which has managed to integrate itself into the corporate information flow, then occurred. When my deputy presented the required information it was grabbed by an outstretched arm without a please or a thank you. Rude maybe, but what a sign of success; to be taken for granted, to be expected to produce the goods.

European Community

The increasing need for local authorities to be aware of what is happening in Europe and indeed to act on the growing number of directives that are beginning to affect local issues has become more pressing. There are now 45 European Documentation Centres based on the larger public libraries and we regularly borrow from our local centre at Liverpool for officers and members of the County Council.

The county's industrial development team also needs to keep a watching eye on funds for employment and social projects that are available from the EEC.

Political parties

As I mentioned earlier there is a lot of material to be collected from the various parties. In pre-election days, it was easy, all we had to do was collect Central Office material. Now it is all change and we have to collect all parties including Social Democrat material. (That last comment has now a prophetic ring with the announcement of Roy Jenkins's candidature in the Warrington By-election).

Local Authority associations

ACC, AMA, ADC, LAMSAC, LOGORU, LASCAB, a whole string of initials disguising a multitude of associations formed by or representing the interests of local government. For translation please read, Association of County Councils, Association of Metropolitan Authorities, Association of District Councils, Local Authorities Management Services Advisory Council, Local Government Operational Research Unit, Local Authorities Service Conditions Advisory Board.

All of these bodies and others are constantly providing and seeking advice on local government, as well as issuing circulars, reports and press notices.

Industry and commerce

Again a two way process, with local government seeking current information from industry on manpower, growth forecasts, employment forecasts, development policies etc. Details of the types of goods being made, investigations for planning permissions. Local authorities have to consider the expansion of industry in relation to Green Belt, Structure Plans and Local Plans. A Green Belt problem arose recently in Cheshire, Shell wanted to develop a major fertiliser plant on Ince Marshes which provide a natural habitat for wildlife. Information on both sides was vital for the decision making process.

Voluntary organisations

There are a great many organisations that seek and provide information of interest. Social service bodies such as National Association of Citizens Advice Bureaux, Disabled Living Foundation, MENCAP the association for mentally handicapped children, WRVS.

The views of pressure groups like Transport 2000, Ramblers Association, etc. are sought when projects are planned.

Professional associations

I referred previously to the wide variety of disciplines in local government and inevitably there is a profusion of professional bodies putting out information to their members and the authorities. Officers receive information from the Royal Town Planning Institute, the Royal Institute of Chartered Surveyors, from RIBA and from the Library Association to name but a few. Statistics are assembled by CIPFA and the Fire Brigade College at Moreton in the Marsh advises its firemen students.

The electorate

Finally, but by no means least, the local authority must have up to date information from its community in order to assess and match needs for the present and the future.

Household surveys, census information, for example, will assist the assessment of the need for school places and provision for the elderly. A number of authorities, including Cheshire, supplement national census information with regular sampling in the form of household surveys. The Chronically Sick and Disabled Persons Act, for example, required that authorities survey their community and there has been a recent spate of transport surveys leading to the submission of TPPs (Transport planning policies) to the Government. On a personal note, we actually replied to a transport survey and were rewarded by a 300 per cent increase in the bus service; we now have buses through the village every day.

Information within the Authority

Up to this point I have considered the information that authorities seek from outside, I shall now look at the need to coordinate the information that is generated within the authority.

Those of you in the audience that have heard me speak before are permitted a small smile or groan at this point as I trot out my hackneyed example which illustrates corporate information problems. Gypsies are a five department problem in Cheshire; Social Services, Planning, Education, Police and Highways, all are concerned with gypsies in some way. Information exists in each department and it is impossible to deal with problems in isolation; material, reports, notes etc. have to cross departmental barriers.

Research is another area where coordination is vital to avoid departments re-inventing the wheel over and over again. Surveys that I have been involved with in the past have revealed duplicate research even within the same department. Some form of research committee to monitor plans is essential and a good example is COORD which has performed this function in Cheshire for the last eight years.

Population statistics are vital to many departments. A household survey can reveal a need for school places which leads to the commissioning of a new school from the architects which in turn is inspected by the Fire Brigade to ensure adequate safety standards for the school population. Libraries are involved in catchment areas, number of households etc. when planning new buildings. In Cheshire the monitoring section of the Planning department has become the acknowledged County source of population information.

Area coding or Geo-code systems are often developed, on the lines of postcodes, to provide unique references to information about an area that can be used throughout the authority.

Building design information is often concentrated in the Architects department and computer departments usually provide advice on new installations for all enquirers.

Systematic approaches to information needs

I have looked briefly at the wide range of services and needs for current information in local government and I shall now move on to my final section which considers the ways in which a number of Councils have attempted to coordinate the total picture.

My research for this paper seems to confirm an earlier impression gained when I gave a paper on Local Government Information Services about two years ago. That is that many of the authorities which sprouted such services in the early Seventies have now disbanded them leaving only a handful of survivors. The systematic coordination of the information needs of an authority appears to have taken even less of a hold. In conversations last week there was general agreement that only three systems could be identified where the idea had become reasonably established.

The first of these is Devon County Council which is applying a scheme called Business System Planning (BSP). They decided at the outset that in order to gauge the needs of the authority they would have to chart its activities. This exercise revealed a chart of business processes related to actual work; the next step was to apply a method study to break down these processes into stages with the information required and its outputs, reports etc., being noted at each stage.

The solutions adopted consisted of an agenda of research projects, a number of computer projects in particular areas and various administrative changes. The budget for the exercise in 1980/81 was £1 million and apart from the results of the exercise there were actual cost benefits in terms of savings in fuel bills, stock holdings and lower insurance premiums.

My second example is the Greater London Council which has had an Information Handling Management Team for the last eighteen months. The team is led by the Computing Department and all other departments are represented on a series of committees each of which is commissioned to examine a particular area.

The GLC Research Library is heavily involved on many of these committees both as a provider of information and as experts on information handling. The library, for example, is looking at Prestel for the whole authority because the GLC is interested in becoming an Information Provider on the system. My own Research Library has also been commissioned to do a similar investigation for Cheshire and these examples demonstrate ways in which libraries can serve the corporate purpose.

One proposal that the GLC team is considering would involve placing computer terminals in the offices of some 100 senior officers over the next three to four years. They are looking for a network of statistics and monitoring services with the intention of creating a London-wide information handling system. The Research Library has also recently made its inhouse computer database available to outsiders via the online information system, DIALTECH. The database title is ACOMPLINE and it is the first local government database to be made available in this way.

Moving on finally to Cheshire, you will have gathered from previous remarks that we have attempted to develop a similar approach to information handling. The Research Library facility has become, over the last nine years, a truly corporate information service which serves elected members, all twelve departments and the eight District Councils in Cheshire.

The service provides a series of current awareness publications, one daily and the others in subject format at frequencies demanded by our clients. It provides full library and information services and acts as an agent for many of the extensive corporate memberships of the County Council. A major document gathering operation is undertaken to ensure that relevant material is available for the decision making process.

A recent and potentially very important development has been the use by other departments of the Research Library's information retrieval package. This system uses the IBM STAIRS package and was originally designed as a library tool. However, because the specification was deliberately made as flexible as possible it has proved to be able to cope with a wider range of input than was envisaged in the beginning. A number of departments are experimenting within this format by actually inputting items that they wish to store and later retrieve. Items include office memoranda, list of contacts and suppliers, and most interestingly, the legal sections are looking at the recording of the text of local legislation which is an important component of local government law. The Research Library, as you can see, is in an important position in the information flow and this has led to constant variety of work and the need to change rapidly in the face of new demands from clients.

Cheshire's computing policy is moving towards a philosophy of communications networks, based on a central switching centre somewhere in the County, which would process all communications throughout the local authority. Links between telephones, word processors, computers, facsimile transmission and the new intelligent Xerox type photocopy/printing machines etc. are envisaged in the system. Very much a move towards the 'electronic office' to control the flow of information.

In conclusion, I feel that I have not really done full justice to the wide range of information needs of local government. I hope that I have shown that there is a growing awareness of the problems within the local authorities and that some solutions are being found. From a purely personal point of view it represents an opportunity for the information profession to demonstrate that it has some very relevant skills which can enable it to play a significant role within the corporate information flow.

Current affairs information for the media

Geoffrey Whatmore

Reference and Registry Service, BBC

Paper presented at the Aslib conference 'Current affairs information—resources and needs', London, 4 June 1981

IT IS MY task to describe how current affairs information is handled by the people who distribute and package it, the media themselves. (I should apologise for the use of that term, which I personally dislike, and so do most journalists and broadcasters, but we have failed to invent a better collective noun.) If there is time we might look at the librarians of the media and consider why there are not more of them, and why the tenets of formal librarianship do not always run there. I shall also be taking a look at computerised information systems, which are by no means ideal for us as yet. But these will grow side by side with conventional systems, so let us consider these first.

What we call current information forms a strand—a broad strand—of all our daily lives. It flavours the very air we breathe, it is with us from the time we switch on the bedside radio in the morning, throughout the day via newspapers, the car radio and the TV evening programmes, until we return to bed. It even follows us around, for there are few parts of the world now where English newspapers cannot be bought or the BBC World Service cannot be heard.

In a sense, all of the media radio, TV and newspapers are in effect information processing factories. They take in raw material—the output of governments, news agencies, pressure groups, local government and most of the organisations and individuals that make up the social infrastructure bearing on our lives—process it, make it readable, interesting, add background, check the facts—and distribute it to millions of people each day and each hour. Within this process are stores of back-up and background data, the province of the information staff.

In spite of all the efforts of bibliographers, indexers and abstractors, it has always seemed to me that there is a yawning gap between the news, data, reports and statistics published today, and about one to five years hence, before it gets into the reference books. Much of it never does. This includes news about people, news about government and politics, up to date information about foreign countries, much social debate and regulations, and is hard to find comprehensively between hard covers.

This is the territory of much of the media information units. We try to capture current information as it is published, index it, abstract it, or keep it in full, and make it available again rapidly in response to an unpredictable and often impatient demand. The methods we use are labour-intensive and expensive. It is worth while for the major press and broadcasting organisations to maintain them because these activities are at the centre of their thrust. As fringe activities the full intensity of effort may not be justified, which accounts, in part, for the paucity of studies of current information systems in the general field.

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The systems which have grown up—I can scarcely say 'have been planned' for they have all been established independently in response to some local need—are substantially different from academic and industrial libraries in a number of respects:

1. Each unit tends to create its own information stocks as distinct from buying it pre-packaged as reference books. This makes for expensive systems and a high proportion of processing and routine work relative to inquiry work.
2. The response must frequently be rapid, sometimes immediate, and usually succinct. This affects classification.
3. The information called for must be absolutely up to date on frequently changing topics; it is highly perishable and must be constantly renewed.
4. The materials are mainly non-book and the librarianship of books is not suited to its exploitation.
5. It tends to arrive in large volumes and must be processed at once if the 'Factories' are not to be swamped with unacceptable backlogs. Today's input must be completed today.
6. The services are open for much longer than most libraries and must be as self-sufficient as possible, since they need information when other resources are closed down.

The sources are not primarily the book but material less tidy and less easy to organise—the newspaper, the weekly or official report, pamphlets of all shapes and sizes, the words and transcripts of broadcasting itself. Reference books are regularly updated and amended in manuscript—a time-consuming and exacting task. Specialists are employed in particular areas of demand—at the BBC we have the beginnings of a caucus of subject specialists, at this time, concentrating on programme research for natural resources and energy and for industrial affairs.

The only way fully to keep up-to-date in a specialised, let alone a general field like current affairs, is to scan the daily output and index it or cut and file it. For the use of the press libraries the main raw material has to be newspapers and periodicals—and for broadcasting, the news and some current affairs scripts form a supplementary source. Curiously enough, these items are treated quite differently by most broadcasting libraries. Indexes, either of the printed or the internally prepared kind, are of only marginal value to them. The problem is volume. Can you imagine trying to follow the tangled tale of the Iran hostages, the Northern Ireland emergency, or background on a busy personality, through an index in a hurry? For the specific item, an index is a satisfactory tool; but from the standpoint of 'instant' information, never forget that consulting an index is a two-staged process. Find the reference, then seek it in the cumbersome pages of back newspaper issues. And then, if you are wrong, start again! For this reason the excellent indexes to *The Times Group* and to the *New York Times*, though handy for pin pointing a fact or a date, are not frequently employed by media people for rapid or general searches.

So, with immense labour, most media libraries scan the press of the day and cut items required, classifying and filing them in major sequences daily. So important is the activity that it is usual to take more than one copy of most items so as to cover different 'angles'—the subject, perhaps a subsidiary aspect, the biographical element or the place. In this way files are created on contemporary issues, pre-classified and selected, reflecting the library's estimate of future needs. The speed of retrieval necessary, the requirement to handle a thousand items a day or more, work against a notational classification. Attempts to use a modified UDC apart, most libraries employ an alpha-classified subject heading scheme—and all are slightly different! There is a task here for an indefatigable genius—a latter day Melvil Dewey—to produce a general classification or subject scheme for current affairs—no-one has succeeded as yet.

As I have remarked, it is curious that in most broadcasting units, scripts are indexed, on cards or in a computer, and not cut and filed like newspapers. Probably the reason lies in the demand, which is most often for a specific remembered item—where index retrieval is supreme. The scripts are not widely used as sources for general information; the TV ones, in particular, being mainly visual, are not the best vehicle for detailed facts and figures. In contrast, at the BBC for reference to specific programmes, we compile via direct computer input a comprehensive index to title and contributors which is sorted on computer and presented as a microfiche listing.

In spite of my criticisms, I should emphasis that the media libraries are nevertheless subscribers to a number of printed indexes and abstract services. We would be lost without *Keesings Contemporary Archives* or the U.S. *Facts on File*, just as we greatly value the periodical indexes or the *Research Index* or card services like *McCarthy's* or *Extel*. For us the problem is that even these are insufficiently current, though they can be excellent for the quick factual check or the provision of a chronology or the terms of a treaty.

Volume storage is less of a problem than it used to be. Nowadays at the BBC most of the older fugitive material, the press cuttings and the scripts themselves, are converted to microfiche within a year or two. It is no longer necessary to have old press cuttings stored in attics and basements all over London. We have our own fully equipped Micrographics Unit and microfilm plays a large part in our working lives. Incidentally, the arrival of the rotary camera and cassette microfilm has meant the virtual disappearance of the huge monolithic collection of card index cabinets which formerly occupied whole walls of library departments.

Like all information people who know their users, we create and maintain special lists, guides, and short cut records to frequently needed information. Accidents and disasters, fact sheets, anniversaries, space shots, budget changes and royal weddings are favourite topics regularly covered. Daily lists of forthcoming events are prepared and widely circulated. SDI services are an excellent way of making friends. Sets of press items about broadcasting and our own internal affairs are cut and circulated. I hope also that the better-orientated of our units do not wait to be asked. The task, as far as they have time for it, is to keep in touch with programme planning, take the initiative and offer help, sometimes as creative suggestions. Surely the enquiry assistant with his unique knowledge of sources and systems should be in a better position than most to produce programme ideas and offer material in support.

As you might imagine, we were very interested in brain death recently. A similar programme on psycho-surgery was the subject of an intensive literature search on external computer data bases by the specialist staff of the Science Information Unit. For enquiries, like this, where there is time to locate full text, the computer bibliographic data bases come into their own.

As I was saying earlier, the computer databases, especially the news ones of which there are several coming on the market, are of enormous potential value. Ideally they should make it unnecessary for us to scan for ourselves the huge product of the information explosion. We are already subscribers to the New York Times Information Bank, to Dialog, Blaise and others and are considering POLIS and NEXIS.

At their best, these may one day enable us to dispense with the space-greedy press cuttings collections which I have described, although for the moment the American virtual monopoly—though it is decreasing—inhibits their full exploitation in British information units.

In addition to what are already becoming known as 'normal' databases, we are looking at other ways to do things better, or with fewer clerical routines. Systems like computer-produced microfilm, which is used for internal computer-assisted indexes, facsimile transmission, LASER, Swalcap, and similar acronyms dear to book librarians are familiar to BBC libraries also.

BBC Data Subscription Enquiry Service has been established to offer a conventional current information service principally by telephone to those outside bodies who from time to time need it urgently but for whom the setting up of an elaborate system is not worth while. Via this enquiry service, subscribers can access a large section of BBC information resources on current affairs. We are only in the development stage of this operation, but auguries are good. We are currently marketing a guide to the Royal Wedding.

Of computer databases, however, especially those merely listing references or abstracts, I confess to some long-term doubts. The trouble is that although each of these offers tempting benefits like a wider range of references easily accessible via a data link, and a saving in staff involved in processing, we cannot be sure whether they represent in themselves the pattern of the future.

When you come to think of the long chain involved in retrieving information from a computer database, involving first the compilation of a search strategy, the entering of this via a keyboard, according to a complex command language, the presentation of quantities, then of references either via VDU or line printer, the subsequent search for these references in periodical literature via Boston Spa or the Science Reference Library, we cannot but wonder whether the laborious stages involved—in spite of the magic speed of computer search—are not leading us up an information cul-de-sac. Is it not possible that in a few years, the increasing rate of technical progress, especially of digital storage, may have improved so much that the storage of references may represent as antiquated a bit of technology as the wind-up watch?

The full-text databases for news offer a better option, for there is no need for the two-stage look-up, and if text can be automatically captured for computer storage without the costly business of human input, the free text searching approach may prove the thing of the future. Meantime, the great debate between the full-text protagonists and the indexers and abstractors goes on.

We do not know the answer, but in the meantime, we hope that one day we may invest in a centralised BBC information system with the aid of a mini-computer so that we can tap in via a single terminal to any internally-generated BBC information. I think we will arrive at this by stages, adding an index or a database at a time to the computer store as justified in its own right. Our problem then may be standardisation.

We are fortunate at the BBC where we can work together with our own consultants on designing new electronic systems. Managers and systems people sit down together and work out solutions, each appreciating the other's point of view because they are subject to the same internal disciplines. This is so much more effective than employing external advisers, who are not always aware of local constraints.

I hope this paper has not concentrated too heavily on the grassroots. It might be interesting for you to know when you go home after this conference and watch Michael Parkinson again, that he has a microfilm reader printer just at the back of his studio, providing him with instantly available information in the form of press cuttings and documents about the people he interviews: or that the Mastermind questions and some of the radio quizzes are checked and verified by groups of librarians working away with conventional reference books: that the TV newsroom has a news library close by where the staff work twelve hour shifts to aid the sub-editors. The PM radio programme is shortly to go on the air and probably the Radio news library is making last minute checks before Radio Four broadcasts at six o'clock. At Television, *Nationwide* is just about ending its usual frantic day following up the morning's news, seeking biography, names, contacts, backgrounds, as well as longer-term research for next week. *Newsnight* has a shade more time in hand but, provided some big news story does not come over from America before 9 p.m. (as it did in March when the President was shot) upsetting the schedule, the features should be ready and some of them already on tape. News libraries should have done their jobs, although the Film and Stills Library people may still be searching for a location shot or retrospective pictures for an obituary.

Today programme for tomorrow's radio is roughly worked out, but there will be another editorial conference in the early hours of the morning to finalise it, and the library is manned all night for the purpose. The indexes to yesterday's broadcast news should be complete by now and, in an hour or so, all the items from today's press should be filed away and ready for consultation.

The job provides the constant stimulation of reference work in a demanding environment working for interesting but difficult people. If the reality involves more drudgery than the tinsel patchwork of light entertainment, it is nevertheless one of the most rewarding and least studied aspects of the library profession. The media are a vast unexplored land for the information worker. Principles wait to be deduced, systems cry out to be devised. Some fascinating short cuts and references exist—but only here and there where a few ingenious people have devised them. Where is the book on media librarianship? Where is the book on current information practice, for that matter?

I am very glad to see that the library schools are beginning to show an interest. Aberystwyth, Brighton, Loughborough and the West London College, among others are setting up courses. What we suffer from now is a lack of experienced lecturers, though time may change that.

Nevertheless, in spite of these omissions, indeed perhaps because of them, the opportunities for development of current information systems in the media have never been better. In the face of economic limitations, there exists today a better understanding of what is needed, on the part of the supplier, and on the part of the consumer, the journalist, feature writer and programme maker. With librarians and computer experts working together, the future looks promising. And the new generation of librarians will play a central part in it.

Current affairs information: Chairman's closing remarks

David Menhennet

Librarian, House of Commons

Presented at the Aslib Conference 'Current affairs information—resources and needs', London 4 June 1981

WE HAVE BEEN discussing the provision of a fast, sometimes immediate, information service in the huge, diverse, constantly changing and crucial area of 'Current Affairs'. I have long felt that this area of information (and research) work—Current Affairs—is one of the most challenging and exacting, as well as certainly being among the most interesting, of related professional fields. We can be assured that the need for precise, reliable, up-to-the-minute information of this kind will continue to grow; that the degree of urgency normally associated with it will persist; and that our professionalism will be fully stretched as we try to meet the demands made on our current affairs information services. We must continue to value and nurture that professionalism. We are fortunate in that we can benefit from an advanced, still developing information technology—BLAISE, CELEX, EURONET-DIANE, and POLIS are good examples, and there are others—which enables us to be much better prepared and which supports and enhances our professionalism.

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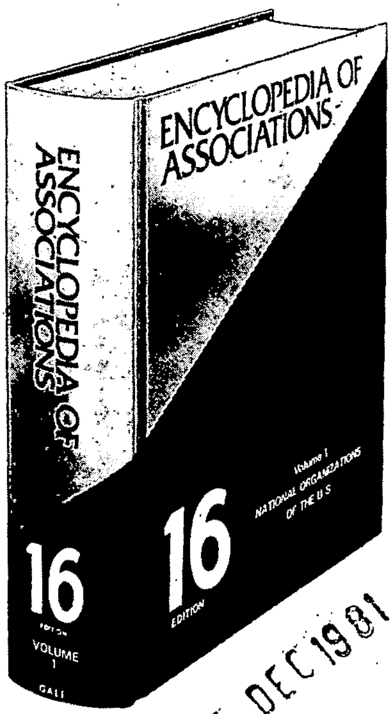

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